Electrical Review

With Which Is Consolidated WESTERN ELECTRICIAN and ELECTROCRAFT.

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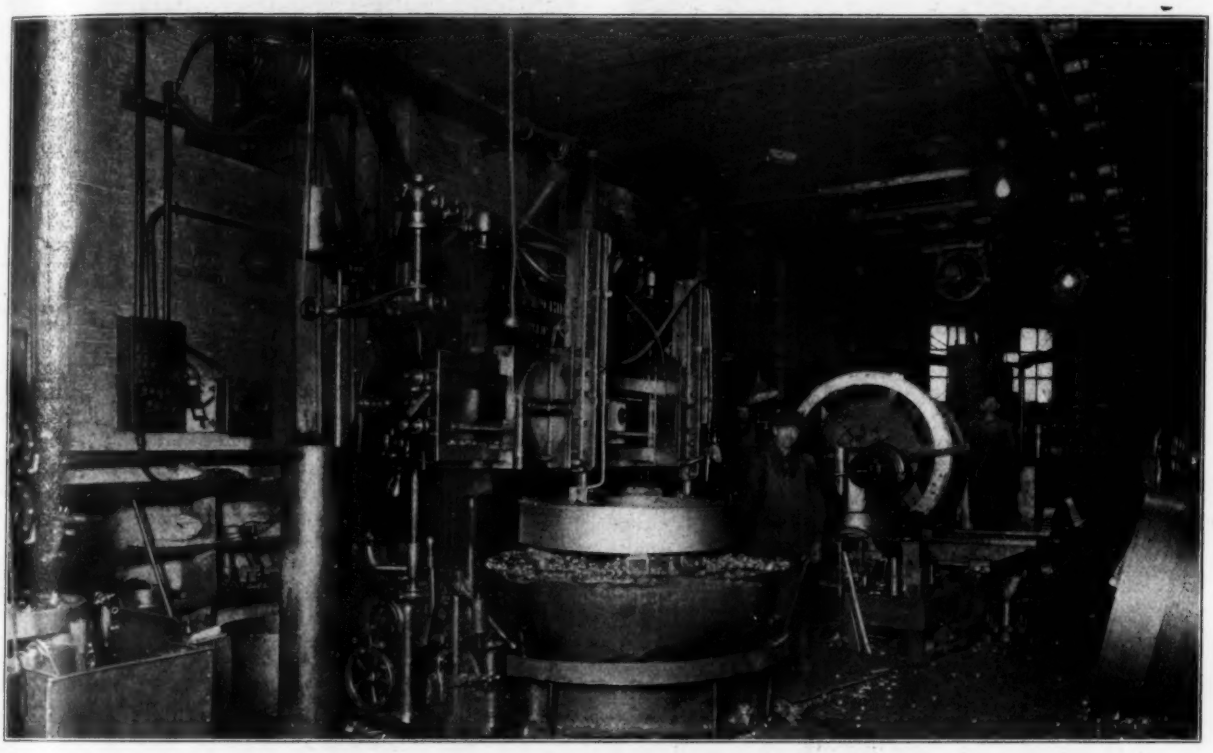


Gear Cutting Shop—One 144-Inch Gear Cutter, Driven by 15-Horsepower Motor.

Electricity in Gear Manufacturing

Details of a Noteworthy Motor Installation That Has Effected Marked Economies—Energy Purchased from Commonwealth Edison Company

FOOTE BROS. GEAR & MACHINE COMPANY, Chicago, has a plant of interconnected shops in which electric energy is utilized to operate all machines and tools. The plant occupies a group of adjoining buildings extending from Curtis Street to Carpenter Street, with office entrance at 213-215 North Curtis. Four floors are made use of for shop equipment required in the manufacture of special and general lines of gears and of speed transformers.

Power, supplied by the Commonwealth Edison Company, is received at 230 volts, direct current, from that company's substation, and there is an average consumption of 70,000 kilowatt-hours a month. The applications of electric power are for driving machine tools and for operating shop hoists and cranes, pattern-making machinery and for other purposes. The motors are installed upon ceiling supports, except in several cases of motors of larger capacity used in driving heavy machines. The transmission of power from motors to machines and shop tools is by belt connection, usually by means of countershafts through which one motor drives a number of machines or tools. The motors distributed to various shops throughout the plant range in capacity from five-horsepower to 65-horsepower, the greater number being those of 10 and 15-horsepower, the speed being governed by the requirements of the different classes of machine work.

The motor of 65-horsepower, installed on the first floor, is employed for driving a battery of Libby turret lathes and other types of gear-turning machines. This motor is a Sprague machine, operating at a pressure of 230 volts and a speed of 600 revolutions per minute. It supplies power to 17 heavy machines. On the same floor are 12 Cleveland automatic turning machines, driven by two motors; one of these is a Hawthorne, 20-horsepower, speed of 950 revolu-

Turning Lathes, With Motor Drive.

Lathe Room for Lighter Work.

tions, the other being a 15-horsepower motor, which is to be replaced by one of 20-horsepower. Those turning lathes are of different sizes, such as to take bars of 1½ inches to 5¾ inches diameter. On the opposite side of this shop, a 10-horsepower motor is belt-connected to a centrifugal wringer, a grinder and a metal saw. Another installation on the same floor consists of a Shepard electric 5-ton hoist and crane, operated by a Crocker-Wheeler 5-horsepower motor, with speed of 950 revolutions per minute.

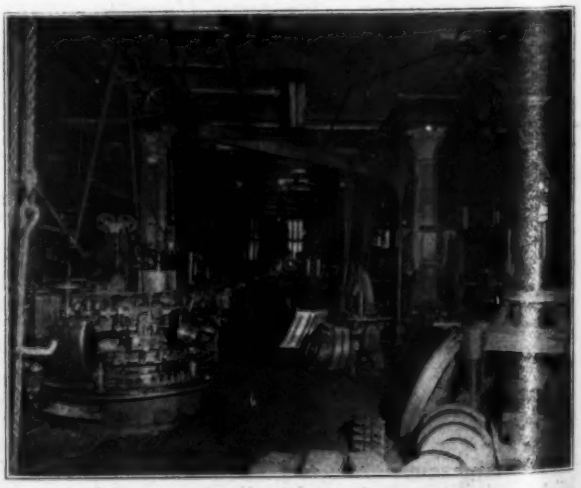
A lathe room on the second floor contains 22 lathes, which are served by a Hawthorne 20-horsepower motor, running at 970 revolutions. The main gear-cutting shop, which is on the first floor of the Carpenter Street side, is specially equipped with spur and worm gear cutters. Included among these machines is a gear cutter of a size capable of cutting a gear of 144 inches diameter; this is operated by a General Electric 15-horsepower motor. Other machines comprise 20 heavy gear cutters, the power for which is supplied by three motors, consisting of a Fairbanks-Morse 15-horsepower, a Western Electric 10-horsepower, and a Westinghouse 10-horsepower. A double-geared planer, in same shop, is run by a Hawthorne variable-speed motor, 7½ to 10 horsepower. A Colburn 90-inch boring mill, operated by a Crocker-Wheeler 10-horsepower motor, is one of the machines of this department.

In the gear-hobbing department are an array of hobbing machines, ranging from 84-inch down to the smallest size used. These are for cutting spiral, spur and worm gears. The 84-inch machine is operated by a 10-horsepower Crocker-Wheeler motor.

In an adjacent department is an installation of six Gleason bevel-geared planers, of sizes for cutting 18-inch to 54-inch diameter gears. These are driven by a Western Electric 10-horsepower motor.

The second floor of this section contains hobbing and milling machines. In one room is a line of eight hobbing machines and on opposite side a line of 12 milling machines, the power for all these being furnished by a Fairbanks-Morse and a Crocker-Wheeler motor, each of 10 horsepower. An adjoining room comprises the bevel-gear generating and roughing department, consisting of eight roughers and 17 bevel-gear generators. The generators, by a rolling process, shape the gear teeth. This equipment is driven by a Crocker-Wheeler 40-horsepower motor. Next in order are ten Fellows gear shapers, and 14 spur-gear cutters for cutting 12-inch to 48-inch gears. The ten shapers and 14 cutters are operated by a Western Electric 15-horsepower and a Crocker-Wheeler 10-horsepower motor . A drill-press room contains two multiple-spindle presses, four radial and four upright and other drill presses, all driven by a Crocker-Wheeler 10-horsepower motor.

Libby Turret Lathes and Other Heavy Machines for Gear Turning—Operated by a Sprague 65-Horsepower Motor.



General View Gear Cutting Shop—20 Heavy Gear Cutters, With Motor Drive.

Reorganizing the Electrical Industry

An Outline of the Goodwin Plan as it Affects Relations Between Contractors and Other Branches and Statements From Leading Contractors on Co-Operation

AT THE annual convention of the National Electrical Contractors' Association, which is to be held at New Orleans, La., October 9 to 13, there will be presented for final adoption, or rejection, a plan for the complete reorganization of the Association. This plan, which has been so carefully worked out by a committee composed of James R. Strong, Ernest McCleary and W. L. Goodwin, is commonly referred to as the "Goodwin Plan" and is without doubt of tremendous significance, not only to electrical contractors and dealers, but to all other branches of the industry as well.

Col. Robley S. Stearnes.

The keynote of the Goodwin plan is "greater co-operation." If the plan is accepted, the first step will be constitutional changes to encourage a membership ultimately of the 25,000 electrical retailers of the country. Without a truly representative membership any association is of little value. Numerous suggestions are incorporated in the plan which provide adequately for the efficient administration of the association on the new basis.

In its broader aspects, the Goodwin plan provides not only for the improvement of conditions among electrical contractors and dealers, but also for a closer co-operation between manufacturers, jobbers and central-station companies.

As was so aptly stated by a joint committee of contractors and jobbers of New York City, it is a recognized fact that certain branches of the electrical industry are today in a very demoralized condition. As this is due largely to lack of proper co-operative effort on the part of the different branches of the industry, it is the belief that, with a proper organization whose primary interest is to educate its members to a greater responsibility, much good can be done in the way of properly serving the consumer and of creating a desire on his part to use electrical appliances and to adopt the idea, "Do it electrically."

As examples of what can be accomplished, we only have to review the work of improvement clubs, societies, chambers of commerce, and similar organizations throughout the country. To state the proposition is its proof that individuals cannot conceive and inaugurate reforms and changes in business methods, permeating a whole industry, but must depend upon organized effort, under effective leadership.

The central stations, through their strong organization, the National Electric Light Association, have brought the lighting and power industry to a high degree of development and while doing so, have reduced rates to the consumer—neither of which could possibly have been accomplished through individual effort.

Electrical engineers, through the American Institute of Electrical Engineers, have been better prepared for their work through fuller knowledge of the requirements to be met and of the means of fulfilling them. This institute is conducted purely for educational purposes and without individual profit to its members, except insofar as they improve themselves by participating in the work.

Electrical manufacturers and jobbers through cooperative work have done much toward educating themselves and as a result have placed their business on a firmer, more economical and more satisfactory basis. It has been proved through this work that, notwithstanding the increased cost of living and the consequent increase in the cost of almost every known commodity, the cost of electrical appliances has been steadily reduced and the quality of the article steadily improved, except during temporary war conditions. The principal effort on the part of these industries has been toward educating their members to the necessity of efficiency in order that the various branches may operate their particular business at a minimum of expense.

Architects have the American Institute of Architects as their national association. We would hardly recognize as progressive an architect who is not a member of this institute. Some of his most valuable information is obtained through such membership and through his affiliation with other architects in association work.

Although electrical contractors have their national and state associations which have done much to educate their members in the proper conduct of their business by frequent meetings and interchange of ideas, yet the electrical contracting industry, taken as a whole, and viewed in the light of the modern acceptation of

the meaning of organization is totally unorganized.

The Goodwin plan, however, provides for bringing every contractor-dealer from ocean to ocean under the fostering care of a great national organization whose duty shall be to bring order out of chaos and establish close co-operation with jobber, manufacturer and central station.

Such an organization will do for the contractor-dealer what the N. E. L. A. has done for the central station; what the A. I. E. E. has done for the engineer; what the A. I. A. has done for the architect, and what the Electrical Supply Jobbers' Association has done for the jobber.

It is fully recognized that the economic and proper channel of distribution of electrical supplies to the dealer and contractor must be furnished by the supply jobber as he at all times carries a complete stock of electrical merchandise, which is at the disposal of the dealer and contractor who, in turn, thus is enabled to serve the consumer, relieving the dealer and contractor from carrying an overstock of slow selling articles, or stock which it is not wise for him to carry.

The adoption of this method would undoubtedly result to the advantage of all parties interested and would assure prompt and satisfactory service.

The nature of the jobber's business keeps him in close touch with his customer and the information obtained from manufacturers regarding new devices, as well as standard lines, is distributed promptly by his salesmen to his customers.

The contractor-dealer is the natural channel for distributing electrical devices to the consuming public. He carries the material in stock and displays it on his counters and in his show windows. The consumer is thus enabled to see the material which he is purchasing and knows that he is getting full value for his money. He can get promptly any information he needs or instructions in the use of various electrical devices, or he may have these devices installed. These things constitute a service that could not be rendered satisfactorily by correspondence with some distant point.

In order to determine just what sort of co-operation exists today, and what suggestions could be obtained for a closer relationship between the various branches of the industry, the ELECTRICAL REVIEW addressed an inquiry to a number of prominent contractors and their views are appended in the following paragraphs.

Statement From A. F. Kahn, Shreveport, La.

CO-OPERATION; "joint operation," as Mr. Webster gives it, places the contractor in a position where he, regardless of his feelings, disposition or position, must, in order to successfully carry on his operation, co-operate with the central station, and in turn with the jobber and manufacturer. However, true, undaunted, reciprocal co-operation is truly idealistic and here's hoping that we will all be ideal, striving to perfect our immature co-operative efforts in the entire electrical industry.

There is not the slightest doubt that co-operation is essential, and there is no sane argument against closer co-operation and affiliation. The great trouble and drawback is that the majority of us, especially the contractors, are not broad enough to fully appreciate the value of co-operative efforts, and are not big enough to set aside petty rivalry and tap our generators on the line to help take care of our co-workers' peak.

Our great trouble is that most of our exciters are too big for our generators and the surplus has a tendency to incite rivalry and animosity. By the time we awaken to the power loss, or energy waste, and see that what we really need is to generate more power and extend our lines to our prospective customers, we naturally find it essential to keep the exciter and generator we have and when we have extended our lines or added to our sales organization, thereby adding

A MESSAGE FROM PRESIDENT STEARNES, N. E. C. A.

IN my opinion, never in the history of the National Electrical Contractors' Association has there been so much interest taken and so much activity leading to broadening the field of the contractor-dealer.

For a great many years the manufacturer, jobber, central station and contractor-dealer have conducted their business, in most cases independent, one of the other. There has been no special effort made to give those in any one branch of the industry the business they legitimately should have, and this state of chaos has gone on, greatly to the detriment of all branches of the industry; more particularly is this true of the contractor-dealer.

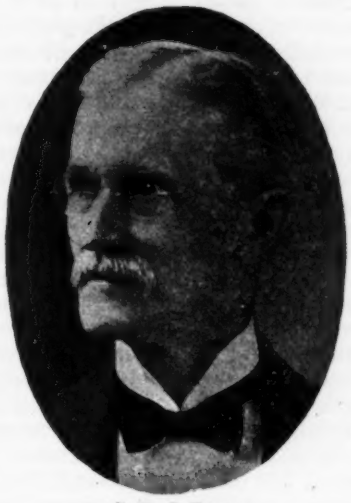
The manufacturer has invaded the field of the jobber, and in some cases that of the electrical contractor. The jobber, in most of our cities, is recognized as the hardest competitor the contractor-dealer has. The contractor has likewise invaded the field of the jobber until conditions are such that the business is getting more unstable and more unprofitable as time goes on. It places the manufacturer in an unrestful condition. It places the jobber where he has to handle a great number of orders and do a great many things not legitimate to his line and not profitable. The central station has invaded the selling field to insure day loads are put upon its lines by selling all kinds of appliances at cost, and on any kind of unusual terms, and the contractor-dealer finds himself, as it were, "up against it" all around, in his effort to deal satisfactorily with the public. For, in my opinion, the manufacturer should deal with the jobber and central station, and the jobber should deal exclusively through the contractor-dealer, and the contractor-dealer should look for his field of operation to the public or consumer.

I think all the above branches are to blame for this condition, probably the jobber and contractor are the most guilty. Neither has conducted his business along proper business lines, and the activity in our organization today comes from the fact that we realize that there must be a change in methods in order to keep the entire business in a sound and healthy condition.

It seems to me there should be some proper and legal arrangement entered into whereby the four branches of the industry would look after their legitimate business on a strictly business basis and work no hardship upon any one of these divisions, or upon the public. Certainly each of these divisions are necessary to the business, and in so far as they may be necessary, certainly there must be a specific field for each to operate in.

Now, to get at this particular field for each industry, and placing it on a strictly business basis, is the work I think should be undertaken. As to the contractor-dealer or the National Electrical Contractors' Association, I believe the majority of its members have awakened to this, and are ready to accept any plans that look business like and legal, and it seems to me that Wm. L. Goodwin is our "Moses" in the premises, and if given the proper co-operation will "lead us out."

J. A. Fowler.



J. R. Galloway.

G. M. Sanborn.

Leaders in Movement for Co-Operation Among Electrical Contractors.

more generative power in the form of mechanics, we find that our rivalry has caused us to drift so far away from the path of co-operation that we are unable to synchronize our machines and the clash comes. We lose our machines, organization and equipment, the jobber and manufacturer lose the balance due on accounts, and the central station loses its once active and material booster.

While the successful contractor is largely dependent on the central station—the furnishers of light and power—he is one of the central station's most valuable assets. In the humble opinion of the writer, the contractor is to the central station what the current is to motor, and the legitimate jobber or manufacturer is an asset to both, and the sooner we place our energies under a pressure equalizer, the sooner will we feel an increased potentiality.

Pardon the personal reference, but an incident comes to mind where a fellow needed a friend and it has to be forced out in order to make room for further thought.

We received a message from a venerable and respected citizen who was, by the way, very strongly "anti corporation." When we drove up to his place of business the old gentleman very feebly hobbled to the front door, one hand very heavily bearing on the huge cane which supported his large body; in the other hand was tightly clasped his outrageous light bill. The old gentleman fairly shook with rage as he stood staring at us over his glasses telling us his troubles in a blustering but unsteady tone. We checked his meter reading and when we informed him that it was about in line, he dropped his cain, placed his large hands on our shoulders, and blurted out: "What! You, who I have watched from boyhood and considered a man among men; you sold out to that Octopus?" After more or less embarrassing conversation we were allowed to check the wattage and in so doing we found the basement, which had been absolutely closed and locked for months, well lighted. This vindicated the "Octopus," as well as "yours truly." By squaring the central station we forfeited a very material order for an isolated plant. Nevertheless we did our duty and we do not feel that we are any the worse off. We turned down seemingly profitable business which in the long run would have proven unprofitable. This, all central stations, contractors, jobbers and manufacturers must learn to do. Many of them are now seeing that business is placed through the channel to which it rightly belongs, and those who are grasping for business through illegitimate channels will soon learn better.

We have for the last nine years signed contracts with the same factory, not only because we considered their commodity as good as there is on the market and because we were well treated, but mainly because they advertise and maintain the policy of selling to the electrical trade exclusively.

The thought here intended to be conveyed and emphasized is that true co-operation is not only materially beneficial to the individual units, the contractor, the jobber, the manufacturer, and the central station, but is also the stimulus which will inspire the entire industry to larger, better and more efficient results.

Statement From J. T. Marron, Rock Island, Ill.

I SURELY believe strongly in co-operation of the different electrical interests, and I believe it is the duty of each one of the interests to work with the other to see that they will make a reasonable profit on their business which is the only possible way of building up a lasting and permanent business.

I believe there should be more protection extended by the manufacturer to the legitimate jobber and dealer as this is the first principle of proper co-operation; in my opinion the only permanent way to build up the business on a sound logical basis. I believe the co-operation between the central station and the contractor dealer is in better shape today than ever before, and I find that the central station is most willing to co-operate with the live contractor dealer.

I believe that each of the different organizations should have a committee on co-operation which should have meetings and recommend different lines to work on, planning and trying to settle the differences amicably where co-operation does not exist.

I am happy to say that the electrical interests in this section are working very nicely together as one big happy family.

Statement From A. C. Beattie, Cincinnati, O.

IN THE first place, I have been an adherent of the idea that a contractor wastes his time when he entertains what I term a missionary peddler. In other

words, a salesman from a manufacturing concern who goes out to the various cities to sell his line of goods for the jobber. This I believe is an injustice to not only the contractor but also to the manufacturer, as the manufacturer gives the jobber an additional discount, or in plainer terms, a better price than that at which the commodity is sold to the contractor or dealer for, and it looks to the writer as though it is the jobber's place to earn that money, not to sit idly by and let the manufacturer send his men and money, because traveling men mean money, out to get business for him; it is an imposition upon the contractor for the reason that if there are two or three manufacturers of the same line of material, and there invariably are, these jobbers have each of their representatives call upon you as a contractor and you hear the same story over and over again, thus taking up a contractor's time unnecessarily. I appreciate that new articles have to be pushed and shown to the trade, but my view is this is exactly why the manufacturer gives the jobber the additional discount or better price. I believe that there is a cure for this which would be beneficial to all, and I know that the real reason of the trouble lies more directly with the contractor than any one else. This is brought about by the fact that we have such a diversified lot of contractors, a great many of them I appreciate are not worthy of a manufacturer putting them on their books, but I contend that if they are of value to be put upon the manufacturer's books, they should also be worthy of being put upon the jobber's books, as a great trouble with the jobber today is that he says he spends most of his time collecting rather than selling the goods. I am quite sure that if the undesirable contractor was turned down by the manufacturer and also by the jobber, that he would get very little consideration from his brother contractor, who is worthy of all the considerations of either the manufacturer or the jobber.

You will note on the above I speak of the rank of the contractor, cleaning out. I may go further and state that the ranks of the jobber could stand quite a little cleaning out in itself, as we have a good many houses which are known as piratical houses, jobbers who live upon a mail-order business wherein they do not fulfill any of their promises or representations unless absolutely made to do so. These houses are of necessity supported with the good jobbers by the manufacturers. This of course works a hardship upon the good jobber. I have known of cases where a jobbing house from another city will send its authorized representative into a community, who will give quotations, represent the goods, and give terms, and when the contractor gives the order exactly upon the representation, quotation and terms offered by the representative, that the house will substitute other goods, change the prices and not allow the terms; and the funny part of it is that they get away with it with some contractors. I believe the good jobbers should co-operate in instances of this character to help exterminate houses that have practices of this kind.

In co-operation, I have for the last 10 or 12 years been nursing a pet idea along the lines of "live and let live." You no doubt know that the manufacturers arbitrarily set the selling prices all the way down the lines—for the manufacturer's agent, for the jobber, for the dealer and contractor. This is done by the fact of their issuing their list prices and sending discounts out broadcast, and brings to mind the fact that upon some commodity a dealer or contractor cannot make over 10 per cent gross upon the article when sold, and if he complains to the manufacturer, the manufacturer says, why, 10 per cent is a big profit. Of course this might apply in such instances where he is selling in large quantities at a time, but when you retail them at a small quantity of one or more, the 10 per cent amounts to very little and usually the dealer or contractor's overhead expense will run from 18 to 30 per cent, and it is a hard proposition for him to make any money when he has commodities which he is forced to sell at any discount that does not give him a gross profit of as much as his overhead. It seems to the writer that if a co-operative movement is on foot in the electrical business that the manufacturer whom we recognize as being the natural head and the source of supply would naturally be the head of any such committee and it would be ridiculous for any of the others to try and dictate what profits the manufacturers should make; that righteously should be his business. But I do believe that if they got together a committee from the contractors, one of the jobbers, and one from the manufacturers' agents and one from the manufacturers themselves in a conference, the list prices of all commodities could be regulated, so that each individual branch of the trade should get a fair and legitimate profit. For example: If the manufacturer sets a price of $1.00 on his commodity, I believe that the committee composed as above stated, could say what profit for the manufacturer's agent would be reasonable, and for sake of argument, we will say 10 per cent. Next would come the jobber, and for sake of argument, we will say that he has decided a 20 per cent profit should be his allotment. Then comes the contractor, and for sake of argument again, we will say that he gets 25 per cent. Now this would make a list price on this article, as I see it, adding first 10 per cent to the $1.00 article, making it $1.10; then 20 per cent, making it $1.32; then adding 25 per cent, which would make the article list $1.65. This is simply an example. But I believe we need some arrangements of that character, not that I want to get into price setting, but I want to abolish the abuse of prices. I do not believe that the committee meeting as I have outlined would in any way transgress the Sherman law or any other law, as it would be more a regulating committee than a price-setting committee.

Another instance of co-operation: My interpretation of the word jobber means a man or a firm who deals in merchandise purchased from the manufacturers in large wholesale quantities and sells *to the trade* in standard packages only. This I know you will agree with me is not the interpretation that the electrical fraternity has. If it had, there would be but very, very few jobbers in the United States, as most of them are not only jobbers but are retailers, and in the majority of cases are contractors; as I know of instances where the jobber will compete against the contractor on new building work where there is going to be a volume of material used, by quoting direct to the owners of the building and then agreeing with the owner to go out and get them the labor to install this material, which they do from unions or elsewhere. This is of course in direct competition to the contractor, as there are very few contractors that do the work themselves; they usually have their men to do it, and as I see the position of the jobbers above cited, he is in the same position as the contractor.

Statement From J. R. Wilcox, Birmingham, Ala.

I HAVE for years been a firm advocate of co-operation not only between electrical contractors and dealers but between all allied electrical interests. It is my opinion, our common goal, "success," can be attained

more quickly and satisfactorily by this method than by any other.

We have here in Birmingham a striking illustration of before and after as regards the lacks of and benefits of co-operation. In the past there has been no co-operation among the different electrical interests with the result that nothing worth while was being accomplished and the fraternity, especially the electrical contractor, was "progressing" backward.

The central station electrical jobbers were selling at retail electrical merchandise and appliances, and in many cases much cheaper than the electrical contractor-dealer could purchase for.

Today this is all changed. Through co-operation we have been brought together and we find that our competitors and friends in the electric field do not have hooks or horns, that they are merely human beings like ourselves and like ourselves are endeavoring to make some progress and are willing to lend a helping hand. The central station and jobbers have eliminated the sale of appliances and merchandise and the contractors are assisting in increasing the central station's load at every opportunity and purchasing from the jobbers in larger unit and aggregate quantities.

A recent issue of the *National Electrical Contractor*, the official magazine of the National Electrical Contractors' Association, carried a statement to the effect that more real good had been accomplished here than in any city in the United States through this co-operation. I do not know just how true this is, but I do know, however, that through co-operation the electrical interests of Birmingham have been greatly benefited and we now welcome our competitor with a smile instead of viewing him with suspicion and reaching for a club.

Statement From Edgar M. Andrews, Richmond, Va.

WITH the exception of four or five contractors, it is everybody for himself, in Richmond.

Answering your request as to what concrete form the writer believes co-operation should take in the industry, at large, without writing a volume on the subject, I should say, first, educate the electrical contractor to the fact that the most vital asset to his business is to join the National Electrical Contractors' Association, which will in turn educate him to the standard of a legitimate business man.

Second, quoting a few statements made by M. A. Curran, general credit manager Western Electric Company, Inc., at Boston, February 21, 1917, "The contractor is the last link in the chain of serving the public with electric power." Also, "That with the community on one side pulling the contractor to connect them up with the current and the manufacturers of power and apparatus on the other side pushing him, the position of the contractor in commerce is assured." Educate the manufacturer and jobber to the fact that with reliable national contractors, it is left with them to boost and market their product, which will be done if the proper co-operation is given the contractor.

To be very frank, at the same time impress my thought as to the necessity of educating the manufacturer and jobber to stick close to the contractor, the writer will appreciate an explanation to the following questions:

Why does the motor manufacturer sell direct, or force the jobber to sell motors, etc., to consumers who are users of 200 horsepower and over at practically the same price of the contractor (which cuts him out) when as a matter of fact the large users are in a better position from a financial standpoint to guarantee the contractor's credit and to purchase motors than the small consumer purchasing one motor?

After the above killing the contractor's ambition, unless there is considerable wiring, why should the contractor take his time to go out and sell one or two motors, that the manufacturer or jobber has not heard about, for a profit that will not pay his overhead expenses?

If this cannot be done, please tell me why this same large user pays full price and commission for an adding machine, cash register, Victrola, Ford automobile, etc.?

Why does the lamp manufacturer spend thousands of dollars in advertising his products, then permits lamps to be sold to the consumer through hardware stores where, in some instances, the clerks know nothing about correct voltage; then, when the customer goes to an electrical store and is requested to purchase a type C lamp, he states that they are a failure, due to burning out at once, simply because the hardwareman sold him the wrong voltage? Is this hurting the sale of type C lamps?

Why does the jobber go out and take small lamp contracts in direct competition to the same contractor, who is selling his lamps, instead of placing it through contractor who can handle it?

Why does the manufacturer market his heating devices, etc., through department stores, who in some cases undersell the contractor, and in others, when contractor calls his customers over the telephone to sell percolator, iron or some other devices, his customers state that they purchased them from department store and sent them back because they were no good, but had substituted gas or alcohol? Does this help the manufacturer? Does this encourage the contractor to sell heating devices?

After the contractor purchases a fan, motor, heating devices, etc., in good faith, and sells to the customer with the guarantee of the manufacturer, then when one of the above is brought back by the customer with trouble, after repairing some little defect, locates that same has to be returned to the factory, why does the contractor have to stand part of the manufacturers' guarantee, by paying all return charges, etc.? Who should pay this? Who is in a better position to pay this?

Statement From F. C. Green, Portland, Ore.

SPEAKING for the local situation, I am glad to say co-operation exists. The electrical contracting business is on a better plane in Portland today than ever before in its history. Central stations are anxious to co-operate. While this co-operation has not yet resulted in as thorough an understanding as might be the outlook is very promising and committees between the central stations and the contractors are working harmoniously.

Co-operation also exists between the contractor and jobber. I might give numerous examples of this co-operation did space permit. We have no manufacturers, and, in fact, prefer to deal with all manufacturers' agents through local jobbing houses. We are heartily in favor of the plans being proposed at the New Orleans convention. The plan itself alone will not bring results but it points the way in which results can be accomplished.

Statement From Geo. Weiderman, Brooklyn, N. Y.

FROM reports in 42 different states received recently by me from the contractors, I can only say that there is quite some co-operation existing between the

J. S. Hilton.

J. T. Marron.

L. B. Van Nuys.

Leaders in Movement for Co-Operation Among Electrical Contractors.

contractors and the lighting companies. The condition is still far from ideal and will require considerable educational work in many of the localities to bring about proper conditions between the electrical contractors and the lighting companies, which it is hoped will be brought about in the near future.

The condition in Brooklyn is ideal. The Edison Company in this city is co-operating in every way and is receiving the cordial assistance of the electrical contractor. The latest improvement has been when the lighting company stopped the furnishing of Mazda lamps at a reduced price and now does not furnish free carbon lamps. The lighting customers must buy their own lamps and these are now sold by the lighting company at list price, which gives the electrical contractor a chance to sell them to the public. This opportunity has been taken advantage of by nearly all the contractors in this city.

The feeling between the central station and the electrical contractor in this city is most cordial and close. Monthly meetings are held between the two bodies, where matters are taken up, discussed and improved upon. These meetings are held in the Edison Company's club rooms, which are furnished by the company. An annual dinner is given by the lighting company each year, to which the electrical contractors and other electrical interests are invited, and is held in either one of the large club houses or at the Academy of Music. During the summer period a water excursion to some nearby resort is taken, where a baseball game is played between the two and later in the day all sit down to a clam bake.

The Edison company maintains the list prices on all appliances and where special sales are made the goods can also be sold by the contractor direct to his customer at a profit and at the special price.

The lighting company employs salesmen to solicit the wiring for private houses, stores and factory equipments. Prices for this work have been fixed by the contractors so that the lighting salesmen can tell the customer what the cost will be for the electrical equipment. This work when secured by the salesman is turned over to the electrical contractor to install.

You will see from the above that this local condition in Brooklyn of co-operation between the electrical contractor and the lighting company is an ideal one at the present time and it is hoped that many other localities may enjoy the same condition.

With reference to co-operation with the other interests, that is, the manufacturer and the jobber, in this location, very little has been done in this locality. Some of the manufacturers, of course, properly so, will sell their products to the contractor direct. The jobber, on the other hand, will not hesitate to sell the public electrical supplies at the same price as he will sell to the electrical contractor, and if the public happens to be a close buyer, can get a price even better than the electrical contractor.

Statement From L. B. Van Nuys, Peoria, Ill.

MUCH has been accomplished in local co-operation in Peoria, Ill., by the work of the Peoria Electric Club, which is composed of members who are contractors, central-station men, manufacturers, jobbers, salesmen, railway men and telephone men. The club meets the first and third Saturday noons of each month for lunch and some talks are made along electrical subjects. That the work has had results is shown by the fact that the club has taken first prize for the best float in the civic parade for the last two years. The original idea of the parade was from the electrical parade gotten up by the club three years ago.

The State Contractors' Association has been working on the co-operation between the central stations and the contractors; the last meeting held in Peoria was the first one where a determined effort was made to bring in the central-station men and the central-station men came and delivered their messages.

Then came Mr. Goodwin, who saw further that the manufacturer and jobber should be included to complete the chain. This condition will surely come and must come for the good of the industry, as we are all dependent on each other.

The contractor has been too much of a contractor and has let the druggist, hardware men and the department stores get to selling the electrical devices used by the public.

No one is better able to judge how good a device is than the contractor (who will be called contractor-dealer). He is the one who comes in contact with the public and is required to make good should the article fail to operate satisfactorily. This makes him an important factor and he should be given due consideration by the manufacturer, who should see that his goods are A-1, by the jobber, who should see that the contractor gets his goods promptly and at the right

price, and by the central station, who should not sell appliances at a price that the contractor could not compete with. But with all this, the contractor must do his part in buying advertised goods made by a manufacturer with a reputation and sold by a jobber who will give him service, then his duty or co-operation with the central station will be to use all his best efforts to increase the load on their lines by being a real merchant and pushing the sale of current consuming devices that will give satisfaction to the public.

The idea of co-operation carried out and lived up to by all the parties will promote the industry to such an extent that all will be surprised at the result.

It seems to me that the idea or scheme of reorganization as proposed by the National Electrical Contractors' Association for the October meeting is the start and should be carried through to completion, then let the state associations take up the idea and reorganize along the same lines; follow this down till you have the organization in each city, then you will find more and better business and harmony in all the branches of the industry. Last but not least, the contractor-dealer will come into the place in the industry that he should have been in a long time ago. Education will do this and the contractor must make up his mind to become a retailer and maintain a store where all the electrical devices will be on sale, and on these he must be posted and know what, when and why they are made and all the uses they have and also he must be at all times ready and willing to make good on his sale, to see that they do give the public the satisfaction they should.

When the organization is completed on this idea, all will benefit and the electric industry will grow faster than it has before.

Statement From A. P. Denton, Kansas City, Mo.

CONDITIONS in Kansas City are fairly satisfactory at this time, though there is still room for much improvement. Our local jobbers have, for a number of years, met with the contractors from time to time and they have shown a willingness to cooperate with us.

We do not come in contact with the manufacturers' representatives, but we meet them weekly in our Jovian Electric Club meetings, and they have always met us on friendly ground. I personally believe that the large manufacturers of this country have not in the past given the contractors the right kind of co-operation. No doubt this situation could have been materially improved had the contractors as a whole been better business men.

Our central station has not made an attempt for the past two or three years to co-operate with the contractors. We have made many advances to them, in fact have tried any number of plans to get them to work with us, but in every instance they have ignored our efforts. Many changes have taken place in the personnel of the Kansas City Light & Power Company during the past few years. During this time the public sentiment towards this company has been growing worse rather than better.

The contractors here are in a position to lend the company considerable aid in clearing up this situation, but they certainly are not going to make any more advances if the company is not willing to meet them half-way.

You can see from what I have said that the central station is the only branch of the industry locally, that we are not receiving co-operation from, and until we do get this co-operation our local situation can not be very much improved. I believe that the central station, more than any other branch of our industry, needs the contractors' help and they can do as much or more for the contractors than the others. We are living in hopes that this matter will straighten out in the near future.

A Statement of Principles

A joint committee appointed by the electrical jobbers and contractors of New York City has evolved the following interesting statement of principles, which should govern the industry:

The co-operation of the central station in each district is highly desirable and a closer relationship with architects and engineers, and others engaged in the industry must be maintained. Heretofore the industry has failed to provide suitable show rooms at which the customer may obtain electrical appliances, therefore we will encourage the contractor-dealer in the establishment of proper stores where material can be obtained at retail.

In order to gain the full confidence of the public in the industry we represent, the class of material furnished and the excellence of workmanship in its installation must be of the highest order. We should never recommend for sale an article in which we have not absolute confidence, and a full knowledge of the functions it will be called upon to perform.

We ought not to consider an installation as tending to promote the best interests of the industry, unless it has met with the unqualified conviction on the part of the contractor that it is of the highest class.

We recognize that in our business, probably more than in any other, the public is ignorant of the quality and merits of electrical devices and their installation. Whether or not they are satisfied depends upon how we serve them. We should recognize that the National Electrical Code, while having accomplished a great good, does not to the fullest extent accomplish the desired results, for the reason that it does not distinguish between standards of material.

We will advocate the employment of one or more competent electrical engineers, whose duty it will be to furnish architects with certificates certifying that work has been performed in accordance with specifications embodied in the contract.

This joint committee condemns the practice of installing work which barely conforms to the requirements of the National Fire Protection Association, and local, State or Municipal Inspection Bureaus, but which is otherwise discreditable. It condemns the practice of substituting lower grade material for that specified after executing a contract. It pledges its influence to induce associations of electrical contractors to exercise great care to prevent their members from evading in any way the full performance of contract obligations.

Caution should constantly be exercised to see that only those contractors are admitted to membership of an association whose character and honesty are unquestionable and who have an established reputation for square dealing.

Statement From James F. Burns, Schenectady, N. Y.

I BELIEVE that co-operation should begin at home first and then branch out. Schenectady dealers and contractors at present have no co-operation from the large electrical manufacturing concern or the electric light company in this city, the manufacturing company sells to employes at factory cost, and the employes compete with the dealers on selling electric goods. The Central Co. station sells at retail below what the dealer has to pay for the same article. Schenectady should be the best electrical city in the world for an electric dealer or contractor, and it would be if there was co-operation given them, by the large concerns that look for the business at a loss to themselves instead of giving a dealer a chance.

Position of the Electrical Jobber

Natural Channel of Business Is From the Manufacturer to Jobber to Retailer and Thence to Consumer and All Branches of Industry Should Co-Operate to Maintain This Distribution

By W. R. HERSTEIN

President Electric Supply Company, Memphis.

NOTWITHSTANDING individual differences of opinion regarding specific matters, the entire electrical trade will doubtless agree that, so far as it may be consonant with existing laws, intelligent and bona fide co-operation between manufacturers, jobbers and retailers would be of great benefit. Co-operation of this character need have no reference to price maintenance; indeed, most of us are agreed that this is no longer necessary or even desirable. However, if the various functions of the three branches could be definitely recognized and scrupulously observed, most of the troubles included in the generic term, "unfair competition," would disappear automatically.

It is not to be thought for a moment that such a utopian condition as that above suggested is actually contemplated. Whatever efforts might be exerted by well-meaning and earnest leaders, there will always be found in any given body of men a certain number of "slackers" or "bad actors" who will turn to their own advantage any situation that may be developed by those seeking to improve the conditions of any industry, large or small, local or general. The main thing to remember, therefore, is that the "good actors" always predominate, and that while they will not accomplish a hundred per cent of what they have in mind, even fifty per cent improvement may be vastly better than the original condition. It will be necessary, however, for every "good actor" to do his bit. The individual effort of each one must be given unreservedly to the improvement contemplated and minor differences of opinion unselfishly disregarded for the time being.

If this doctrine could be consistently preached by the National Electrical Contractors' Association, the Electrical Supply Jobbers' Association, and the more recently founded Manufacturers' Association, in connection with an earnest effort to properly classify and fix the functions of the members of these several organizations, the result would alone justify the existence of these bodies.

The natural channel of business is from the manufacturer to the jobber, then to the retailer and from him to the consumer, and anything that tends to divert or disturb it will, of course, set up currents in other directions. If, for example, the retailer attempts to go over the head of the jobber, and buy direct from the manufacturer, it may be reasonably expected that the jobber will pass by the retailer and sell direct to the consumer. The converse of the proposition is equally true: the jobber who seeks the business of the consumer will have no grounds for complaint when he finds his contractor-customers deserting him, or his manufacturing friends calling on his own retailers.

Here is a direct conflict of interests—an entire lack of co-operation—in short, a chaotic condition, and one which will inevitably arise whenever the natural laws of business are violated. That this chaotic condition exists largely today is unfortunately too true. There are too many manufacturers acting as their own distributors; too many hyphenated concerns who attempt to be both jobber and retailer at one and the same time; too many smaller hyphenates who are confessedly retailers but who aspire to be jobbers when expediency prompts. Even the consumer has caught the infection, and not infrequently appears on the stage thinly disguised as a would-be contractor whose only customer is himself.

As bad as it appears, however, the situation is not hopeless. Natural laws will always assert themselves and prevail over temporary obstructions. As stated in the outset, it will require the best efforts of the big men, the earnest men, the "good actors" in each division of the industry. Nowhere can these efforts be better exerted than in such gatherings as the annual convention of the National Electrical Contractors' Association. Here will be found congregating together the big men of all three branches—the leaders, ready and eager for action—and beside them on the same convention floor, those lesser members who need to be taught. The opportunity is here—not for the complete consummation of all that may be desired, but for one of those telling efforts which, coupled with additional efforts on other occasions, will go far toward solving our present problems and placing each class of electrical establishment in the position where it may more nearly approximate a hundred per cent efficiency.

Fuel Famine Predicted by Coal Operators.

The seriousness of the coal situation is set forth in the September 22 issue of *The Black Diamond*, a publication representative of the coal interests. The array of facts presented from the operators' viewpoint tend to forecast a fuel famine by the beginning of winter. East of the Ohio-Indiana line, the Government price is 79 per cent. above the mine price in 1915, and in the meantime the cost of production, it is claimed, has increased 300 per cent. This leaves the operators facing a daily loss. In the west, it is asserted, the operators were making a profit of 1½ cents per ton at the time the Government price-at-the-mines was fixed; and since then the cost of operating has so increased that the most favored companies are losing from three cents to five cents a ton. Others less favored are losing 15 to 25 cents per ton.

As a general average for the whole country, it is estimated, the production costs are rising from 7½ to 15 cents per ton per month. Mine timbers have advanced 150 per cent. in cost, and labor costs have risen sharply. It is predicted that, under a system of rigid selling prices and uncontrolled cost conditions, the result will be enforced suspension of operations.

Perhaps the worst phase of the situation, as set forth by the operators, consists of the shortage of miners and the insistent demands of those at work, of

an increase of 20 cents per ton for the practical man and a flat increase to $5 per day for unskilled workers. Demands for men at $6 per day in the construction of army cantonments took hundreds of the latter away from the mines.

Reports are compiled showing a decrease in production of 3,000,000 tons for the month of August, for the entire country. A greater loss for September is indicated. It is claimed the country has on hand a case of administering the coal industry to the verge of ruin, with a fuel famine impending as the result.

Utilities in South Central States Faced with Coal Shortage.

Central Kentucky utility plants continue to face a serious situation with respect to a supply of coal, while similar operations in southern Indiana are reported to be anxious about the supply. The crux of the situation is the strike-closed southeastern Kentucky-Tennessee field which has been producing on a basis of only about five per cent since the first part of August. Relief appears to depend on what is done at Washington to force some kind of a resumption of operations. Two questions are involved in the strike—the arbitrary prices fixed by the Fuel Administrator, which many of the operators say cannot be maintained without losses, and recognition of the miners' union, which operators decline to accede to and which appears to be the principal contention of the miners.

At Lexington the power plant of the Kentucky Traction & Terminal Company, which supplies a large part of the surrounding territory, has been operating on a hand to mouth basis for some time, due to failure of the coal supply from the strike field. On special dispensations the Chesapeake & Ohio Railroad has been providing limited quantities of coal at the expense of the shipments to the Lake region. Western Kentucky is being invaded by representatives of industrial and other consumers who are literally begging coal, being unable to offer any inducements to the operators who are bound by the Government schedule of prices.

Large Order for Electrochemical Company.—Users of electric furnaces and electrochemical methods in the manufacture of both ferrous and non-ferrous metal alloys have been stirred by the announcement that the United States Steel Corporation is contracting for its entire ferro-vanadium, ferro-manganese, ferro-silicon and other similar requirements for next year. Between 25,000 and 30,000 tons of 50-per-cent ferro-silicon is involved, and the contract was taken by the Electro Metallurgical Company, the leading producer. This is the largest order ever placed. On its contract made in 1916 for this year the steel corporation paid $100 per ton for its ferro-silicon. No information is obtainable as to what price will be paid on the new contract, but as the quotations for the product have been advancing the last year, it is considered likely that a higher level was fixed. It would not be surprising, however, if a sliding-scale agreement is reached.

Relations Between Electrical Jobbers and Contractors

By FRANKLIN OVERBAGH

General Secretary, Electrical Supply Jobbers' Association.

THE position of the electrical supply jobber and his relations with the electrical contractor should be so clear that no chance for misunderstanding would be possible. The position of the jobber has become firmly established by many years of effort in his special field. The furnishing of capital for the purpose of building a plant to store the appliances gathered from the many producers; the introduction and sale of products of all kinds used in the industry; the facilities for furnishing promptly in large or small quantities the appliances required by the contractor are some of the points suggested to keep in mind when wishing to refresh the memory regarding the jobber's position as an economic factor in the industry.

From the producer's standpoint the jobber can fairly be described as his sales agent. In fact he is more than that because he takes from the manufacturer his output, stores, sells and distributes and pays for it. No known method of distribution can equal in economy and efficiency this custom of the producer.

There seems little room for difference of opinion as to the relations that should exist between jobber and contractor. Of course, the most confidential, cordial and willing-to-help relations must exist if business is to flow along lines that should be fair and reasonable. The course of business follows paths that have been established by custom and practical experience as the most natural one. If this line of reasoning is sound, the relations between contractor and jobber should be pleasant and profitable.

Promoting Efficiency in the Home

How the Contractor and Dealer Can Capitalize on Present Conditions by Instituting Campaigns for the Sale of Domestic Appliances

By M. V. RUTHERFORD

Sterling Electric Company, Minneapolis.

ALTHOUGH the contractor and dealer are very closely affiliated in promoting electrical efficiency in the home, they are to be considered individually and from entirely different phases. Under these conditions, let us treat them as separate units and then as a combined pulling power.

The successful contractor has to be first a finished salesman—a man who is so saturated with electrical efficiency that when he comes in contact with his prospective customer he so fills them with his magnetic ideas that they are attracted to his viewpoint.

It indeed takes some convincing power to persuade the ordinary man that he should discontinue his old style gas lighting and install modern electric illumination. May be this same man has the belief that his mode of illuminating is efficient; possibly, because he has not had occasion to compare it with modern electric illumination.

The hardest customer in the world to persuade is the self-satisfied one with antediluvian ideas that because his grandfather participated in certain things he should do so also.

After obtaining an audience with your customer and gaining his confidence, it becomes necessary to convince him that you can wire his home, covering every minute detail and yet not even mar the decorations; also that when the job is completed the eye will be unable to detect one thing out of place. Suppose you have sailed along serenely up to this point, and that you have convinced your man that electricity is what he needs to make his home complete. Here is where your customer, in a suspecting way, remarks, "Well, young man, what is the cost of all this modern convenience you prescribe to make happy my remaining days in the old home?" Right here is where many an estimator loses his courage—and the job. Figure the job at a fair margin of profit and firmly and convincingly give your customer your figure, holding uppermost in your mind the thought that for every penny spent for wiring he will receive ten-fold modern conveniences that will not only please him beyond a doubt, but will make him in turn an ardent booster of the game.

If the contractor that wires the house sells fixtures,

Educational Show Window of Sterling Electric Company, Minneapolis, Minn.

he stands the best show to have the customer purchase them from him. If not, the contractor is invariably asked whom he recommends as a progressive dealer. Picking out the fixtures is a matter of the customer's individual choice and depth of pocketbook.

The house once properly wired and equipped is a haven of golden harvest to the electrical dealer who is alert and on the job. The first thing to suggest and sell my lady of the house is an electric iron. This is usually followed with the sale of an electric toaster or grill. Do not try to sell her an expensive washing machine or vacuum cleaner at the start, but give her an opportunity to experience how wonderfully some of the cheaper electrical appliances will lighten her labor. Besides, remember that "friend husband" may not be in favor of any more extra expense, as he has probably just paid the bill for wiring of his house.

A vacuum cleaner is probably the next most necessary article to broach selling, as they are really used more than any other appliance in the home, and are within the financial reach of the ordinary layman. When "Mrs. Housewife" has conscientiously used the appliances already mentioned and discovered how wonderfully efficient and free from hard labor her housework has become, she is a good prospect for a washing machine. If the electrical wares she has purchased for her home are of representative quality, they give her very little trouble and she at once becomes a very valuable asset, because of the free advertising and boosting that she will do.

When an electrical contractor is also a dealer he naturally has the combined forces of the two called into play, and as a single working unit make conditions more ideal.

A great many contractors make their mistake by lack of advertising. Show me the electrical contractor that advertises, and I will show you the contractor that "Mr. Citizen" seeks out when in search of electrical construction of any kind. The up-to-date contractor is advertising continually, through such mediums as newspapers, magazines, folders, circular letters and attractive and educational window displays. This individual advertising, combined with that generally done by central stations, is doing much to promote electrical efficiency in the home.

As electrical contractors, we do a great deal of advertising, especially in the building and real estate sections of local papers. We find Sunday the best day for this class of advertising, as the Sunday papers devote much time and space in getting up an attrac-

Bedroom of Bungalow in Sterling Store.

Dining Room of Sterling Bungalow.

Electrically Equipped Kitchen of Bungalow.

Laundry of Bungalow Equipped with Electrical Ironers.

tive building section that appeals to the man interested in such information.

Many women in search of electrical wares are ignorant of what they really desire. Under these conditions, it is up to the electrical dealer to educate them. A woman will read an ad in the paper, that a certain kind of cloth is on sale for 30 cents a yard. She knows it will take five yards to make her a dress, so goes to the store, makes her purchase and is satisfied. Now let this woman come into an electrical store and she will through sheer ignorance ask the salesman for "one of these little round brass things that go into the electric box up in the attic," provided she wants a fuse plug; or on the other hand, if she is in search of an appliance cord for her flatiron, she will invariably ask for "some of the hose that goes on to her light fixture and attaches on to the iron." These cases, however, are fewer today than they were before the electrical game played such a part in modern efficiency of the home. This is due to the fact that the combined efforts of the electrical industry are bringing into play their forces to educate the customer toward gaining a knowledge of the electrical industry.

The Dealers' Opportunity.

From the electrical dealer's standpoint, we figure out many ways of educating the public by means of advertising and window displays, as well as educational exhibits at fairs and expositions—not forgetting to mention our electric bungalow, recently installed at very heavy expense.

This bungalow is a completely furnished and electrically equipped home that occupies a floor space of about 20 by 50 feet. No expense has been spared in furnishing and decorating it as carefully as you would your own home. The draperies, rugs, wall decorations, and, in fact, every detail, are carried out to blend harmoniously with the eye. Proper receptacles and outlets are placed throughout the house to show just how the modern home should be wired. Every up-to-date electrical appliance that goes to make the electrically equipped home is installed therein.

The bungalow is open every day during business hours, and a lady demonstrator explains in detail to the prospective customer the advantages and cost of operating each electrical appliance. On certain days practical cooking demonstrations are made. All this we do to educate the public to the fact that electrical appliances actually take more drudgery out of the housework than all other modern convenience combined, and at much less expense.

Seasonable advertising of merchandise we consider a valuable asset also. In January just before the inventory we clear out our stock by advertising

Stop wishing you had electric light -Have it!-

Do not deny yourself and your family the convenience of electricity any longer!

Do not refuse your wife the help of this matchless servant. An electric iron or vacuum cleaner will save her strength and nerves, and give her time for the children and those little social pleasures which mean so much to her.

Years of experience in doing work of **quality** have made us one of the largest electrical firms in the Northwest. This is worth considering the next time you are in the market for electrical wiring.

STERLING ELECTRIC CO.

29-31-33 So. 5th St.
Phones: N. W. Main 2162; Automatic 34736.
"Service and Satisfaction With Every Transaction."

Wire that house for Electricity-Stop the loss!

Every day your property remains unrented means piling up LOSS—Taxes, Insurance, Interest, Depreciation, Repairs. The house *unwired* for electricity is always in second place of desirability.

Prospective tenants are willing to pay better rent where they find the opportunity to enjoy better lighting and the numerous comforts and conveniences of electric service.

PLACING YOU UNDER NO OBLIGATION we will be pleased to send an estimator to figure complete installation. Just call us over either phone. Auto. 34376. Main 2162.

Sterling Electric Company
33 S. Fifth St.
"Service and Satisfaction With Every Transaction."

Two Recent Advertisements Advocating House Wiring.

and holding pre-inventory sales. In June our advertising carries suggestions for the June bride. During the shopping rush in the days that precede Christmas all of our ads convey the idea of making it "An Electrical Christmas." This special advertising can also be utilized to great advantage during conventions or any other big gathering that bring tourists to your town.

An Ohio Electric Vacuum Cleaner
$3
For THREE DOLLARS
THIS IS HOW—
By purchasing one of fifty red tagged Ohio Electric Cleaners on sale Wednesday and Thursday of this week—and
Making a Down Payment of $2.00 and the Next Payment of $1.00
SATURDAY ON APRIL 20th RED TAG DAY
THE TWENTIETH
person making this second payment of $1.00 and register as a visitor through our Electrically equipped Bungalow, we will give you a receipt in full for the Cleaner purchased. At the end of thirty days when the third payment is due, we will give a second receipt in full for the cleaner purchased to the tenth person making their payment promptly on the day due, which is May 20th.
All of those who are unable to get one of the first lot be sure and get your order in Monday. The second lot on sale during Monday and Tuesday of this coming week. Watch our ads.
THE NEW MODEL OHIO-TUEC ELECTRIC CLEANER PRICE $35.00
$3.00 Down and Only $3.00 a Month Until Paid For.
Attachments for various cleaning purposes extra.
STERLING ELECTRIC CO.
29-31-33 So. 5th St.
Largest Electrical House Furnishers in the Northwest.
"Service and Satisfaction With Every Transaction"

Announcement of Unique Vacuum-Cleaner Campaign.

Still another mode of selling your wares is to hold selling campaigns, at which time you offer extra special means to induce the public to buy. A very successful campaign that we held this summer was launched by giving away a $35 vacuum cleaner, as an inducement to start the campaign, and create interest in the sale. A copy of one of our newspaper ads published during this particular campaign and giving full information is shown herewith.

During the month of September, we executed a very successful selling campaign on the same cleaner, only under a different system. This was called our "movie money campaign," whereby the customer paid the first week 15 cents (the ordinary admission fee to a first-class motion-picture theater); the second week 30 cents, the third week 45 cents, and so on, adding 15 cents each week until a total of $1.95 was reached. Then each week there was a reduction of 15 cents until the payment was reduced to the original 15 cents paid the first week. Then a new start was made and the plan continued for thirty-eight weeks, at which time complete price of the cleaner was paid up.

To launch this sale we took a full-page ad in one of our leading Sunday papers. We, however, also utilized part of this page in advertising washing machines and ironing machines.

The contractor and dealer that go into the game with the idea of educating the public first, and then selling them worthy merchandise at a price within their means, are doing all in their power to promote electrical efficiency in the home. The day is now here when in every city such electrical companies exist, and the time is not far away when every contractor and dealer will fall into line. When this time comes every home will be so electrically equipped that hard labor will bow before its master the great modern genius—Electricity.

Women to Drive Electric Taxicabs in Detroit.

A significant indication of the growing shortage of men chauffeurs is embodied in a recent advertisement of the Detroit Taxicab & Transfer Company, Detroit, Mich., for women to operate its electric taxicabs. The "copy" indicates that feminine drivers would only be employed during the day, between 7 a. m. and 6 p. m., and that they will receive exactly the same schedule of wages as the men.

As the company states, experience is unnecessary, since the driver of an "electric" needs only a few hours' training to become thoroughly competent. The ease of operation of the electric vehicle, the simplicity of its mechanism and consequent infrequent disorders and repairs, together with its cleanliness, noiselessness, attractiveness and speed, have made it particularly successful in this line of work.

The electric taxicabs of Detroit have enjoyed continued success for three years, and the fleet has been increased from one to nearly one hundred cars. Chicago is also the home of a prosperous fleet of electric taxicabs. Twelve cars were put into service in April to supplement 20 gasoline cars, but the "electrics" have practically displaced the gas cabs, as patrons constantly request them. St. Louis also has its fleet of successful electric taxicabs. In addition to other advantages the cost of operating electric taxicabs is about half the cost of the gasoline type.

Electrical Interests Co-operate in Developing a "National Will to Victory."

There is a nation-wide movement on foot to bring home to the people of the United States a proper realization of what constitutes a national will to victory; a movement designed to teach our people their individual parts in the waging of a successful war. This work is being carried on jointly by organizations of patriotic business interests and departments of the Federal Government.

A definite place in this movement has been assigned to the Electrical Exposition held annually in New York. This year the National Government, the State and the city of New York, and the American Red Cross Society are joining hands with the electrical industry in making a comprehensive exhibit and demonstration of modern warfare from various angles. Electricity is so widely employed in making and transporting munitions and food products, in actual fighting on land and sea, in the air and beneath the waters, and in surgery and therapeutics, that the Electrical Exposition in 1917 serves as an ideal agent for the purpose.

Co-operation in Modern Home and Apartment-House Wiring Practice

Plea by a Western Central-Station Man for Having Central-Station Take Initiative in Co-operative Work, Especially in Educating Architects and Builders

By FOSTER RUSSELL

MOST of us know what co-operation means, at least in a general way, and we grant that we should co-operate with those whose help will further our business, and have numerous if vague ideas as to why such co-operation is necessary. Our plans of the form co-operation should take are probably as numerous as we ourselves.

I most certainly do not propose to tell you to cease all worry since the problem is solved by a couple of days' investigation on my part. But I have investigated the matter somewhat through interviewing the various parties interested, namely, the architects, builders, electrical contractors, owners and central-station men, and some of the results of this investigation, especially since they represent the opinions of those with whom we wish to co-operate, may serve as a basis for a discussion helpful to us all.

The subject of "Co-operation in Modern Home and Apartment-House Wiring Practice" divides itself naturally into five main headings advantageous for the purpose of study and discussion, as follows:

1. What is co-operation?
2. Who should co-operate?
3. Analysis of present conditions.
4. Investigation and study.
5. Conclusions.

What Is Co-operation and Who Should Co-operate?

Taking these up in order, we must first define co-operation. Webster tells us that the "co" is from the Latin preposition "cum," signifying "with, together, in conjunction, etc." and the "operator" from "operari," meaning 'to work.' So, we have it: "to work with" or 'to work together." Political economy denies co-operation as the "association of a number of individuals for their common benefit." We understand, therefore, that our problem is to plan a method of working together for the common benefit.

Now who should co-operate? Not a hard question from the central-station man's standpoint. He is emphatically in favor of securing the co-operation of the electrical contractor, the builder, the architect and the home owner. He is sure the central station will benefit, and does not worry his head about the others, taking it for granted that they will do it for his sake.

We have seen that Webster said something about all parties benefiting in co-operation, and it does not seem unreasonabe to suppose that, unless we can show the architect and the others wherein they, too, benefit, any plan which we may develop will have sand for a foundation, the several interests being knit just about that close.

Those Who Will Benefit and the Extent of Their Benefit.

The central stations are, of course, the leading figure in any scheme of co-operation and on them will fall the burden of the work, since they are to receive the greatest benefit. It is not out of place to remark right here that in co-operation as in any other activity we receive benefit to the extent that we give.

Aside from the direct sales resulting from our activities along this line is the fact that anything creating a better feeling in the public or in organizations meeting the public in lines that touch our business reacts directly to the benefit of the central station, for it means almost an immediate wider use of electricity with the consequent increased revenues, and the feeling of understanding generated smooths down a multitude of possible misunderstandings, complaints and trouble.

The electrical contractor, too, will benefit directly if our plan operates. His business is that of supplying the accessories to the service we sell. The modern contractor does not wire a house, receive his pay and then forget all about the transaction. His possibilities have just commenced when the wiring is inspected O. K. for every use of light is a live prospect for numberless electrical appliances, so a good job and a satisfied customer ought to mean a steady stream of sales. Co-operation will also mean a raising of wiring standards, for understanding on the part of the architect, building contractor and owner will cause them to demand and be willing to pay for the best.

The building contractor and the architect perform almost the same functions. Sometimes an owner contracts with the builder, who in turn has his plans and specifications drawn up by the architect, or if he goes direct to the architect, the latter places the contract with the builder. For purposes of discussion we may safely assume that what applies to the one applies to the other, differing only in degree.

Co-operation to Promote More Liberal Electrical Facilities in the Home.

Electricity is making rapid strides in the home. It is more and more universally used for lighting and light table cooking, ironing, etc. It is capable of greatly extended use, however, in various appliances such as electric ranges, water heaters, vacuum cleaners, dishwashers, etc. This more liberal use is now restricted to a great extent by lack of adequate circuits and convenient outlets.

The problem of overcoming this hindrance was attacked by Mr. Russell in a supplementary report presented at a joint meeting of the Northwest Electric Light and Power Association and the Washington Association of Electrical Contractors and Dealers. It is reproduced here in condensed form to aid more active co-operation in complete electrification of the home.

Some building contractors build for sale, hoping that a buyer will appear when the house is finished, like it and take it off their hands. They realize that the deciding factors in most every sale of a house are those little conveniences dear to the housewife. Witness in any new house the built-in features, the cozy kitchens, the breakfast room, etc. Who doubts in this age of electricity that convenient switches, baseboard receptacles, appliance outlets and, not the least, an all-electric kitchen, including wiring for the range, water heater and several appliance outlets, is and will be the big feature that wins approval of the prospective home? These features, while important in closing the sale and making satisfaction permanent, come to less than three per cent of the total cost of the building, an amount insignificant considering the importance of the results.

The architect is the expert on home building. The house, standing as a monument to his ability, he naturally desires to be the last work in perfection, for his client must be satisfied. Little things must not crop up in a month or a year to make the home owner discontented. In the electrical line this is particularly important, since the electrification of the housework is comparatively recent. Many almost new houses are now being torn up to add to their meager wiring that they may furnish a means for the use of the simpler and now almost necessary common appliances, preparations for which were overlooked or disregarded during building.

The electric range and water heater are easy to remember, as are the usual appliance outlets, but it is a simple matter among all the things that occupy the architect's attention during the hurry of planning and building for him to forget, say, a fan outlet for the front porch or an extra bedroom outlet for the curling iron, heating pad or radiant heater. Possibly he does not know whether these things require the same or different circuits. And should he suggest to the owner a burglar alarm or emergency circuit where one switch in the bedroom can illuminate the whole house, he would be adding to that pride of ownership which his whole labor is planned to create.

The Conditions Met With.

The owner is sometimes largely responsible for conditions as they are. He may appreciate the convenience of such electrical fixtures and outlets as are brought to his attention, but through inability to look ahead and with so many new things on his mind, in trying to hold down the expense he cuts out a few outlets here and there, never realizing until months afterwards when he is looking for some place to attach a stand lamp or a vacuum cleaner that the convenience of that particular outlet far exceeds its first cost. If he decides that he cannot get along without it and orders the necessary wiring done, he is sadly shocked to find that it costs about three times what it would have been if included in the original work. Naturally he then thinks wiremen are robbers, possibly does not do the work and we all lose.

In case of a new or a remodeled house or apartment the owner goes direct to either the builder or the architect and places the work in their hands. Whichever one he selects secures the help of the other, and sometimes through him the electrical work is placed with the wireman, although builders are more liable to deal directly with the electrical contractors.

When the house is ready for occupancy the owner calls on the central station for service. The central station has no contact with the architect, builder or wireman, and none with the owner until it is too late to be of any assistance in an advisory capacity. This shows us that the labor of co-operation will fall on the central station. We must further study the relationship existing in order to find out where we should direct our efforts. The owner, holding the purse, is the central figure about which all the others revolve, and seems the logical one to go after. If he proves too hard to reach, the architect and builder are the next most important, as they are in direct contact and are acting in an advisory capacity to him.

As the prospective home owner does not come to public notice through taking out a building permit when his plans are pretty definitely settled, the only way to reach him in time to be of benefit is to secure his name from the architect or builder when he goes to them, failing in which, the only other available method is to canvass all the available prospects. In a town having 20,000 lighting consumers, renters and owners, probably half that number contemplate building or remodeling, certainly far too many to canvass except in the most general of methods and conducive of almost no results.

Educating the Architect.

We are forced then to the conclusion that our only hope of a successful co-operation lies through the architects and builders. We must either educate the architect (and the builder) to the "home electric" idea and through him reach the home owner, or secure from him a list of prospective owners and circularize and call on them ourselves.

To do either or both difficulties must be surmounted. An architect, unless there is something very definite in it for him, is not going to take the trouble to hunt us up and tell us that so-and-so is contemplating building a new home. If we rely on him to transmit the information to the owner, we are relying on a salesman already carrying several lines and one not any too well versed in our own. No one can present our case as well as we ourselves, as we are experts in one line and live and believe in our service.

It is important to note that the architect is a little jealous of his profession, usually preferring that all matters relating to the new house be taken up through him and not direct with the owner. This condition was very evident in checking over the answers to a questionnaire submitted to certain architects and which will be referred to later. Most of us who have had dealings with the fraternity will vouch for the fact also. A condition such as this cannot be remedied by a discussion such as ours or by a nicely written paper placed in the architect's hands. What, then, is a method through which we can secure our ends?

We have always looked upon the architects as the hardest persons to get along with of any group with which the central-station salesman comes in contact. Most attempts to win their confidence and co-operation have been sporadic and failures. As a class, they know just little enough about us, possibly through an unsuccessful attempt to have a pole moved or a service put underground at our expense, to distrust us. And it is only human to adopt a criticising attitude toward that which we do not understand. That homely saying is all too true: "If you're not for us, you're forninst us."

I personally called upon fifteen architectural firms in Spokane, and was agreeably surprised to find them all human, and polite enough to appear interested in what I had to say about our desire to co-operate with them. I left with each a list of about thirty simple

questions, and which each one promised to answer and return to me, an action requiring not over fifteen minutes' time. At the end of a month, after receiving two replies, I again called, to find the questionnaire mislaid or forgotten. I left other copies and at the end of another month had received four more replies.

This experience and a study of the replies that were received teaches three important points:

(First) That the only way to get in touch with the architect is through constant personal contact in a helping rather than an "I want" attitude.

(Second) That the architect, if he admits that he will accept help, does not know what form it should take, or what matters cover.

(Third) That he prefers that matters be taken up through him and not over his head.

These replies also showed that the architect uses no electric range himself, although each one has clients who do, and that they have only the most common appliance, the iron, in their homes. It was interesting to note that they always plan for all the necessary outlets in a new building, notwithstanding our views in the matter. Another peculiar bit of information was that the average kitchen chimney costs from $30 to $60 and is not necessary where electricity is planned for cooking.

Further evidence in the case of the owner and architect was secured from a questionnaire submitted to the Washington Water Power Company range salesmen. Some of the questions and answers were as follows:

Q. How much do owners of new houses appear to know about electrical equipment?

A. Very little.

Q. Are they interested when you call?

A. Yes, usually very much.

Q. What are they interested in?

A. Cooking, water heating, house heating.

Q. What points should be taken up with the architect and owner in planning a new house?

A. Wiring for range, water heater and appliances.

Q. What matters are most generally overlooked by the owner and architect?

A. Same as above.

Q. How would you suggest getting more houses electrically equipped?

A. Keep in touch with architects and builders.

These same salesmen stated that over 90 per cent of the new houses that they called on were not electrically equipped other than with necessary lights. The foregoing answers sound as though manufactured to fit this discussion, but the fact of the matter is that each salesman answered a list by himself not knowing the others were doing the same, and not knowing what use it was to be put to. The surprising thing is the answers were practically unanimous on each question quoted.

These opinions from the men on the firing line furnish additional proof that we are on the right track when we consider the architect as the one on whom to concentrate our efforts and through him to reach the owner. It would seem a good plan to make a special effort to equip every architect's home with at least a range and water heater, and if possible a vacuum cleaner, washing machine and smaller appliances.

As there is no better salesman than the satisfied user, and as the architect as the expert on home building is looked to for advice on all home labor-saving equipment, this condition would do much to make our work easy. A few words about a little extra wiring at the psychological moment would do more than any bothersome calls by the electric salesman. And an architect enjoying the comforts and conveniences of the electric way in his own home is without question more liable to speak these few words than one who knows only by hearsay about the later electrical equipment. Anything that the architect knows is going to add to the owner's enjoyment of and satisfaction with his new home, he is sure to try to have placed in it, for his reputation and future prosperity depends on satisfied clients.

Bearing in mind that our investigation showed that the only way to get in touch with the architect is through direct personal contact, that the architect himself does not know what information will help him, and that we cannot carry matters to the owner over the architect's head and expect to retain standing, the following is suggested as a solution of the problem of co-operation which confronts us.

The Plan of Co-operation Suggested.

The personal element contains the solution of the problem. One good man should be selected in each town, who should be responsible for keeping in touch with the architects there. Probably at first a short letter should be sent each firm of architects and to every builder, announcing that Mr. John Doe has been appointed by the power company as special agent to be at their service in matters pertaining to electric wiring and equipment. "Mr. Doe will call on you in a few days and make himself known and will be glad to assist you in every way possible, as in location of services, advice as to wiring layout, burglar-alarm systems, lighting layouts, etc. Matters pertaining to our service will receive especially prompt attention if taken up through him," etc.

The man appointed to that task should possess tact, knowledge and a good personality. He should get around to each architect and builder as often as was found best, and do his utmost to obtain and keep their confidence. Each time he should have some new matter of interest possibly set forth on a standard-sized typewritten or mimeographed sheet handy for filing and reference. He should always be on the lookout for things which will be of interest for future data sheets, and should endeavor to secure the names of prospective home builders with permission to call on them in the name of the architect in order to explain some electrical matter. Often consultations might be arranged for at the architect's office to take up in detail the wiring and electrical equipment of the new home.

The special man should keep in close touch with lighting and appliance development, and secure and personally hand to the architect the manufacturer's catalog of such as he deems of interest. One time it may be an illuminated number plate for the front porch, another time data on a new family-size refrigerating machine or an exceptionally good disappearing door flush receptacle for appliance outlets.

Knowing what Mr. Smith put in his house, the agent would not have hard work in getting Mr. Jones to at least do the same if not better. It only takes a start to set the ball a-rolling.

Through his calls he will learn from time to time of certain information which the architect requires or can use in his work. One may ask for the prices of wire and materials that he may check his bids, another may want the color of light from various types of lamps or the relative absorption of light of different shades of wall paper or interior finish. And so on

through a long list of such subjects as follows:

Height of wall outlets and switches.
Over-all dimensions of electric ranges.
Method of lighting the grounds.
Rectifier or motor-generator set.
Lighting for special occasions.
Electric drying room for the laundry.
Data on exhaust fans, etc.

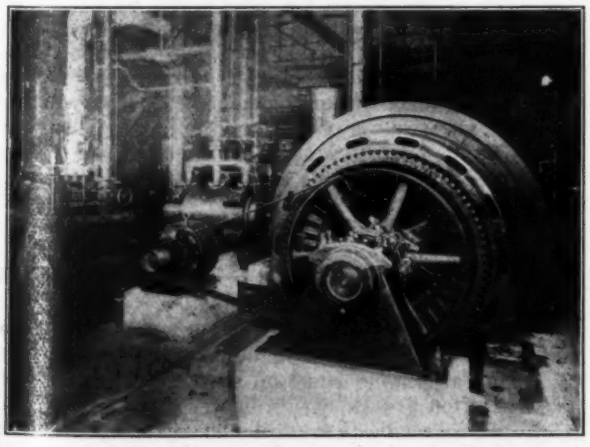
The booklet entitled "The Electrical Equipment of the Home," published in 1912 by the Commercial Section of the National Electric Light Association, would be a good starter to place in the hands of all architects, builders and persons contemplating building. This book is not complete, since it does not contain the later developments in electric home equipment. However, a year's experience of a few such special representatives as has been suggested would result in a collection of much valuable information bearing on the problem of co-operation, which could be worked into a simple and perhaps more useful form.

We have attempted to show in this paper that at present there is no real co-operation between the owner, the architect, the builder, the electrical contractor and the central station. We have analyzed existing conditions and investigated the matter to find, if possible, some plan of co-operating to the mutual benefit of all parties concerned. The evidence has proven that the central station must bear the burden, and must reach the owner and the architect and builder. It has shown that it is only possible to reach the owner through the other two. No good can come of flooding the architect with a mass of catalogs or statistics if the personal contact is absent. And we must concentrate our efforts toward equipping the home of the architect himself with the most convenient electric appliances possible.

SYNCHRONOUS MOTOR FOR HIGH-SPEED AMMONIA COMPRESSOR.

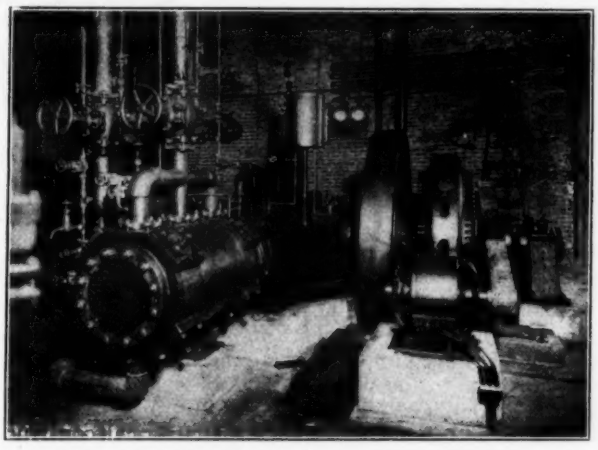
Other Features of Electric Drive in Jefferson Ice-Making Plant.

The Jefferson Ice Company has put in operation a new ammonia compressor unit in its ice-making plant



Electric Machinery Company Synchronous Motor, Driving a De La Vergne Ammonia Compressor.

at 515 Bickerdike Street, Chicago. This consists of a high-speed, short-stroke compressor, 15 by 18-inch cylinders, manufactured by the De La Vergne Machine Company. It is a machine of new design, and has the capacity of 120 tons, measured in tons of refrigeration. It is driven by one of the Electric Machinery Company's new line of synchronous motors, rated at 165 kilowatts, 230 volts, 60 cycles, three-phase, with a speed of 200 revolutions per minute. In making a



Another View of Electric Machinery Company Synchronous Motor, Direct-Connected to Ammonia Compressor.

direct connection of the motor to the compressor a heavy fly-wheel is mounted between them to equalize the torque. The compressor is made for high speed and the initial run of the motor showed about 205 revolutions. The direct-connected motor for the ammonia compressor is of comparatively recent development. Formerly most of such compressors were belt-connected to Corliss engines and driven at low speed. The synchronous motors of high speed are proving their adaptability to the new line of compressors built for about 200 revolutions. Severe starting conditions are eliminated by special phases of construction. An automatic transformer, installed behind the switching panel reduces the voltage for starting. The exciter unit which is a part of the new installation, consists of an 11-kilowatt, 125-volt, 88-ampere direct-current machine, belt-connected to the main unit.

It may be said of the direct-connected synchronous motor that it does away with about 8 per cent belt loss; it runs at 100 per cent power-factor, or if desired it can be over-excited so as to give leading power-factor, thus raising power-factor of whole connected load as at this plant about 14 per cent. It is figured that it gives about 5 per cent better efficiency than an induction motor of the same characteristics.

The old equipment in this plant, still doing effective service, consists of a 150-horsepower General Electric motor, belt-connected to a 160-ton Creamery Package Company ammonia compressor, operating at 205 revolutions. There is also an auxiliary unit, consisting of a Western Electric 25-horsepower, 220-volt, 60-cycle motor, driving a small compressor.

Two Ingersoll-Rand air compressors, each driven by a 20-horsepower motor, are employed for agitating the water in the freezing tanks. Likewise, in brine agitation, three mechanical agitators are required, each driven at a speed of 1200 revolutions by a Fairbanks-Morse vertical, three-horsepower motor. The Richardson-Phenix Company lubricating system is in use in the plant.

Current, which is supplied by Commonwealth Edison Company, comes into its six pole transformers at 9000 volts, and is stepped down to 220 volts for use in the plant. The Jefferson plant has a capacity now of 160 to 170 tons of ice every 24 hours.

Effect of Fluctuating Prices on Unit-Cost Systems

Typical Views Relating to Present Prices for Material and Labor and Their Effect on Methods of Bidding for Electrical Construction Work

INSPECTION of the bids submitted by electrical contractors in a great many cases discloses a surprising variety in the amounts bid for exactly the same work. It is not easy to believe that such wide variations exist in the actual carrying out of the work by different firms if it is done according to the specifications. It may be that the diversity in the amounts bid is greater in cases where the specifications are not definite, but even in cases where the specifications leave no doubt as to the work to be done very wide ranges in the amounts of bids are frequently to be noted.

In some cases the contract for electrical construction work is not given to the lowest bidder, but to one who can be expected to do the best at a reasonable price. In a majority of cases, however, the work does go to the lowest bidder if he is regarded as a responsible party who can be depended upon to carry the execution of the work to a finish. The result is that contracts frequently go to electrical contractors who carry out the work at a loss, and frequent failures of men engaged in this business are the well known result. It is of interest to inquire why such big differences should exist between different bidders for doing identical construction work.

In any cases where there is a variety of bids it is probable that while some are below the actual cost of doing the work others are much higher than actual cost and represent an extortionate profit. In either case the condition may not be a deliberate one upon the part of the bidder, but may represent his ignorance as to what will be the cost to him of carrying out the specified work. In other words, his bid is nothing more than a fairly good guess. In other cases estimates have been made of the cost but the estimating has been done so poorly that the result is not even a close approximation of what the cost will turn out to be. Poor estimating is therefore a frequent occurrence.

Unit Costs Necessary.

The necessity for accurate estimating of jobs of electrical construction cannot be too strongly emphasized. Two things are necessary for an accurate estimate. One is that all of the work to be done should be included and none of it overlooked. The other is a knowledge of the unit costs for different kinds of work. To insure that a complete list of the material required should be drawn up, it is of great value to have blank forms on which all possible requirements are listed, and the filling out of one of these blanks will safeguard against overlooking any important items. Such blanks can be drawn up in different forms for different classes of work. To estimate labor costs accurately it is necessary to have an accumulation of data from previous installations. This points to the importance of keeping records of time and costs on all work done and of summarizing these in such form that they are available for reference and for application to future jobs. The successful man in this, as in most other lines of business, is the man who knows his unit costs.

Next to accurate estimating of the cost of material and labor comes the inclusion of a proper allowance for overhead expenses. A few years ago this was a much neglected item of cost, but so much emphasis has been laid upon it by the associations of contractors and others that it would seem doubtful that any contractor could fail to make some allowance for it. However, in many cases ignorance of the actual value of the overhead expense prevents the making of an accurate allowance and here again accuracy depends upon the existence of proper records in the bookkeeping department. It should be recognized that overhead expenses vary from time to time with conditions of work, with the volume of business transacted, etc., and that percentages that apply at one time to one firm do not necessarily fit another time or another firm. Accurate cost keeping is necessary for the contractor to know just where he stands in this respect.

Poor Business to Take Business at a Loss.

It must be admitted, however, that all low bids are not due to ignorance as to costs, but that they sometimes result from a deliberate purpose to cut under the bid of other contractors for the sake of securing the contract, even though this may be done at a loss. This is not only as a rule poor business, but it often represents a low standard of ethics as well. The loss on a certain job may in some cases be regarded as an advertising expense, but it is very questionable as to whether this is the most desirable form of advertising. A reputation for cheap work is not nearly so valuable as a reputation for first-class work. In other cases it may be expected that by skimping in material or in work it will be possible to get by at the figure quoted by not strictly adhering to the specifications. This of course is a form of dishonesty and should not be considered by any reputable contractor. Another motive which applies in certain cases is that although no money may be made upon the main contract, there will be extra work not covered by the specifications for which a high enough price may be charged to let the contractor come out not only without a loss but perhaps with a substantial profit upon the entire job. This is not only poor business but it is also very risky. It frequently occurs that high estimates on the extras result in this part of the work going to a different contractor and the original bidder is thus left in the lurch. Each job of work and each part of a job should be taken only on the basis of a price which will pay for its own cost and leave a little margin for the contractor. The hope of getting additional work on the basis of a job done at a loss often proves a will-o'-the-wisp.

In the following paragraphs are given the views of two prominent contractors in regard to unit costs and the possible effect of the present high prices on prevailing systems of bidding.

Statement of A. J. Newell.

It would seem to us that a unit cost system, or in fact any system of cost keeping could be made available for estimating purposes under a varying cost of material and labor, provided the prices of the various

items at the time the job was done were shown on the cost sheet. If this was done the present cost could be readily determined by noting the difference between the cost record and the present market price.

The company with which the writer is connected does not believe in a cost system for determining labor that is based on a daily report made by workmen of the amount of material installed. Such a system depends on a workman to keep records where it is for his interest to make a favorable showing.

In our own business we do not attempt to determine the cost of any part of a job until the entire job is finished. The total cost of the job is then determined also the total cost of the various items entering into the job such as time, wire, conduit, expense, tape and solder, etc. After these totals have been determined they are then divided by a number corresponding to the principal elements affecting the cost of that class of work. To illustrate: In the case of a conduit job, we divide by the total number of feet of conduit used and show a list of the lengths of each size. For wiring a dwelling house divide by the total number of outlets, switches and receptacles. For a mill lighting job divide by the total number of lights and local switches. For a power job divide by the total horsepower as well as the length of conduit used. In the case of a power job with open wiring we determine the cost of the labor per pound of wire used, and in every case a list is drawn up showing the number of feet of each size of conduit and of wire used and sometimes both. In addition our cost sheets show the percentage of labor and percentage of expense to the total cost of material.

We have found the data thus obtained give the best and most accurate basis for estimating work, and our estimated costs are very close to actual costs of the job.

This method gives the total and final cost of doing a piece of work and does not depend on the workman to keep records, except to put down his time each day for the job he is working on. It covers the cost of any mistake or delays and shows the cost as it has to be paid for by the contractor. It also gives an excellent check on the workman and enables the contractor to know which of his workmen can do a particular class of work to the best advantage.

Statement of E. M. Raetz.

With a properly organized cost system the retail prices of jobs should bear a proper relation to the cost of materials and labor, no matter what this cost is; so that a proper profit on every job will result. We should not let the customer's opinion have any influence on or cause us to change this relation. The real cost of material and labor is a hard, cold fact, while the customer's idea of what the average wiring job should cost is about as tangible a thing as the pot of gold at the foot of the rainbow and it is just as logical to try and meet your customer's idea of cost on a job which you know more about than he does, as it is to expect a child to find this pot of gold.

The first requisite to a knowledge of costs is of course a proper accounting system for recording all the vital facts which are necessary to an analysis of costs and the various factors entering into them. It is beyond the scope of this discussion to suggest such a system, but they are readily available. The important fact to remember is that if you haven't a cost system get one as soon as you can, and spend enough to maintain it properly. Here is where many business men make a mistake by hiring low-priced help for office work; one might better pay double the salary of an inefficient bookkeeper for an alert accountant who can tell you the facts you want to know and tell them quickly.

The writer believes that the universal estimate sheet gotten out by the National Electrical Contractors' Association is one of the greatest helps toward solving the question of knowledge of costs, if properly used, which can be found. Proper estimating is of course of prime importance if the contractor is to make a profit. To do this requires careful and accurate estimating of materials and labor required for a given job to the cost of which should be added a proper percentage for expenses which should include all items of expense other than those already charged directly against the job and to this should be added a net profit. This profit should not be regarded as wages nor in any other manner than a just and proper revenue to which the owner of any property is entitled, like the rent on a house. No one thinks of renting a house he owns to someone else free, so one should not permit the use of his business, materials, tools, his capital, without a proper return on the investment.

A good way to plan a unit-cost system is to go over completed jobs and classify them. All buildings of one class should be placed under one heading and distribute the labor at so much per unit of materials, and note on the data sheet the special conditions under which the job was carried on. We all know that work costs more in the winter time than in the summer season, but we always have work to do during the winter, so that due allowance should be made in estimating work which is liable to extend into the cold weather. Having thus a basis to work on one can readily compare different jobs of the same kind and strike an average as a temporary basis to work on. When new work comes up one can refer to the data at hand until more definite data can be gathered. This can be done by keeping accurate records of the work as it progresses by apportioning the cost of work to date over the unit quantities of materials in place. For instance, when a conduit job is all roughed for wiring the labor cost up to that date can be apportioned over the quantity of conduit and fittings and thus keep improving the system until after several jobs of one kind, say school buildings or standard buildings of any kind, have been done this class of work can then be estimated with great accuracy. With this as a basis one can more readily tackle estimating special work, or such work which cannot be readily classified under regular or standard. With these data at hand one can feel that he is estimating under the exact conditions peculiar to his own location and conditions.

When every contractor has worked up such a system of unit costs the only difference in bids will be due to the variation in prices on account of quantities which should not be great, and the owner who is taking the bids will not get suspicious of the high bidder or wonder about the financial responsibility of the low bidder, for there will not be the foolish difference which now prevails in many cases. There will always be errors, but these are the exception and not the rule.

Proper estimating means time and study given to the subject; no one can be expected to run over a plan in an hour and get all the facts which bear on the carrying out of this branch of the work on a building, so careful study should be made and all tendency to hurry the process avoided. It is better to lose the job than lose money through errors due to haste in preparing the bid, but the signs are pointing to better things in the electrical contracting field.

Editorial Comment

Reorganizing the Electrical Industry

AS is set forth elsewhere in this issue by prominent electrical contractors, whose views on the necessity for a reorganization of the electrical industry with special reference to a greater recognition of contractors and dealers are presented, the annual convention of the National Electrical Contractors' Association, which is to be held in New Orleans, La., October 8 to 13, will undoubtedly be one of the most important meetings in the history of the contracting industry.

During a period of tremendous growth, when the demand for electrical equipment then available reached such volume as to give everyone an opportunity to participate in a developing market, there was not much necessity for careful analysis of or attention to the business methods pursued. The prospect of rich returns was alluring; the incentive for great activity was manifest. Consequently, the aggressiveness and genius for organization of the American inventor, manufacturer and distributor soon discounted the market for electrical material and then came the battle for supremacy. The inevitable happened, and for several years we have been deploring a lack of a settled policy, a lack of harmonious relations and a lack of standardization and stability in price.

At the convention to be held next week a new constitution is to be submitted to the delegates in attendance, which, if accepted, will not only permit of a complete reorganization, which will perhaps result in many thousand new members, but will establish the contractor-dealer on a basis that will tend to weld their interests with those of the manufacturer and jobber for the common good. The effort is being made to establish a definite relation with regard to the electrical supply jobber in doing business with the contractor and the dealer, and the contractor and the dealer in doing business with the ultimate consumer.

The leaders in this movement urge that the electrical contractor and dealer realize the opportunity and responsibility which a policy of this kind incurs. It is the opportunity of the contractor to demonstrate his ability to so effectively work for the creation of new business that the jobber can rest satisfied with the demands made upon him upon the part of the contractor, for the manufacturer to remain satisfied with the demands made upon him upon the part of the jobber and for the central station to remain satisfied with the development of its load. With the contractor bestirring himself to an active and intelligent endeavor to increase the utilization of electrical material, much of the effort heretofore made by the jobber and the central station to secure added distribution and more adequate demand, in spite of the apathy of the contractor, may be directed to working with and for the contractor.

That it is possible to achieve the results promised by the leaders in this movement is evidenced by the success which has attended the methods of the California Association of Electrical Contractors and Dealers, not only in organizing its own members, but in dealing with the jobbers and central stations. This success has not only attracted wide attention, but has stimulated activity among others, notably in the neighboring Pacific States. Under the leadership of the same men who are responsible for the national movement, the electrical contractors of the Pacific Coast have set themselves to the task of some real accomplishment along lines that may well be considered in other parts of the country.

It will require unremitting labor upon the part of the contractor-dealer to live up to his opportunity and it will require patience and support upon the part of the manufacturer, jobber and central station. If they all work together and do not expect too much of one another, the problem will solve itself and the basis of effort of patience and of reward lies here, the same as it does in the relation of any other parties to an obligation, in absolute faith in one another.

The Dealers' Opportunity

CONDITIONS resulting from our entrance in the war, particularly with regard to the keener appreciation of economy and efficiency in the home, have emphasized the value of domestic electrical appliances in a striking manner. Electric washing machines, ironers, vacuum cleaners, ranges, etc., have done much to solve the servant problem, lighten the labor in the home and do the work not only in a more efficient manner but at a considerable saving over other methods.

It can truly be said that the present opportunity for electrical dealers is a golden one, especially with the approach of the Christmas season. As is so aptly stated by A. L. Swanson, a prominent Evansville dealer, "the opportunity for an increased sale of electrical home labor-saving devices is not only knocking at the electrical contractor-dealer's door, but is trying to burst it down. Right now is the chance of our lives. If we don't do a job, the department store, the hardware store and the drug store, also the central station and about half a dozen others that have locations, are going to do it for us, and then there will be a real howl,

the same as there has been, because others are handling the small appliances."

It is true that the present margin of profit on the small appliances does not permit of lavish expenditures for campaign purposes but there are hundreds of methods of participating and building up a profitable merchandising business. The article by M. V. Rutherford, in this issue, gives only a few of the many sales ideas that can be adopted by progressive dealers.

Looking beyond the immediate profits, it is distinctly to the advantage of every contractor and dealer to become known as a wide-awake electrical merchant. Manufacturers and jobbers must be shown that the retailing of electrical appliances can best be done through the regular channels and when this is accomplished the competition of central stations, department stores, hardware stores, etc., will cause little concern.

Contracts and Taxation

PRICES agreed to on electrical and other contracts placed within the last few months indicate that the government has come to realize that industry is entitled to a fair living profit. It is the testimony of many who have done business with Washington on so-called "war orders" that the federal authorities have been inclined to meet them more than half way. In important lines, where production or contract work under pressure has been required in the construction, wiring, etc., of camps for accommodating hundreds of thousands of fighting men called into service, prices made by those in a position to furnish the needed work or supplies have been accepted largely without question. Moreover, the government has exerted itself in the matter of making prompt payments in order to facilitate the completion of contractors' work and lessen the financial strain on business through the tieing up of vast sums in materials and labor before the contractors could realize in full upon their work.

Without doubt the consultations which have been in progress at Washington between officers of the administration and the best brains of the electrical and other industries have had much to do with bringing about this disposition to co-operate. Men familiar with the practical workings of industries upon which the government leaned, and of which material sacrifices were asked, have been taken into the confidence of those officially charged with the conduct of the war and their advice has, as a rule, been promptly heeded. That, in large measure, is the secret of the remarkably efficient mobilization of resources which has taken place since last spring.

A recent evidence of this spirit is in the "drafting" of Frank A. Vanderlip, president of the National City Bank of New York, and his installation at a desk in the treasury department. This is primarily for the purpose of directing the work of distributing $2,000,000,000 of war savings certificates among the wage-earners of the country, but also to act as adviser to Secretary McAdoo in the larger matters of war finance and to give to the government the benefit of his knowledge and affiliations in the campaign for the Liberty loan. All these developments of harmony and "team work" in the nation's undertakings, which industrially and financially are the greatest in the history of the world, promise much for the vigorous prosecution and success of the war.

From a legislative standpoint the drafting of industrial resources by emergency taxation has been less happily done. As the revenue bill stands now, it looks as though the taking over in cash of such a large percentage of book profits may seriously interfere with future manufacturing and contracting. So much of the profit figured in double-entry bookkeeping has to go right back into the business to maintain equipment, provide for accidents, insure against labor difficulties, delays in obtaining material, etc., that the real cash profit may be little or nothing. When the present tangled situation in Congress clears up a little the ELECTRICAL REVIEW will have more to say on this point.

Few Failures this Year

IF serious economic disturbance had resulted from the half year of adjustment to new war conditions, its effects would be seen in the insolvency statistics; but no evidence of such a condition appears in the record. Instead, comparison of commercial failures with previous years makes an especially gratifying exhibit. For the nine months just ended they number only 10,737, including but an insignificant percentage in the electrical industries, and involve $141,950,038 of defaulted indebtedness, exclusive of banking and other fiduciary suspensions. These figures compare with 13,250 business reverses, involving $154,586,707, reported to R. G. Dun & Co., in the first nine months of 1916, and with 17,288 in 1915 for $241,464,060. The present returns, in fact, are the best since 1911; while in number the September defaults, but 963, are less than for any month in six years, and the liabilities, $11,903,051, are the smallest, excepting those of May, back to last October. When it is remembered that more people are in business than ever before, and that there have been many other factors calculated to enhance the possibilities of financial embarrassment, the small percentage of failures is highly favorable.

Copper Dividends

AN interesting side light on the facts brought out editorially last week is the announcement that in September the owners of leading American copper shares had in dividends a total of $27,232,000. This compares with disbursements in August of $11,467,000 and of $26,389,000 in September a year ago. In the first nine months of 1917 these copper companies have paid to their stockholders the huge total of $140,437,443, compared with $107,681,058 during the same period last year.

HAPPENINGS IN THE INDUSTRY

Utility Valuation by Wisconsin Commission—Electrical Gift Campaign Inaugurated—New Construction Work at Riverton Power Station—Wars' Effect on Technical Education

UTILITY VALUATION BY WISCONSIN STATE COMMISSION.

Report Submitted on Two Subsidiaries of Wisconsin Edison Company.

Pending a decision on rates, two subsidiaries of Wisconsin Edison have been valued by experts for the State Commission and the findings show that the equities exceed the companies' outstanding securities by a considerable amount. The situation was commented on by an official of the company as follows:

"After three years' work, the engineering staff of the Railroad Commission of Wisconsin has submitted its report on the reproduction cost of the properties of the Milwaukee Electric Railway & Light Company and Milwaukee Light, Heat & Traction Company, subsidiaries of the Wisconsin Edison Company. This valuation was made as of January 1, 1914, and showed a reproduction cost of $37,319,297 for the property of the two companies. The capital expenditures of the companies during the intervening years up to January 1, 1917, were $3,206,700. The reproduction cost on January 1, 1917, would accordingly be $40,525,997.

"This figure does not include any allowance for working capital or going value. The companies had cash and accounts receivable of $1,174,000, which, when added to the reproduction cost, gives a total valuation of $41,699,997.

"Against this valuation of $41,699,997 the companies had outstanding $41,006,000 par value of securities, or about $694,000 less than the reproduction cost of the properties. In order to determine the present value of debt represented by bonds sold at a discount, the unamortized discount may be deducted therefrom. If this is done, the present value of bonded debt and outstanding capital stock and notes is $39,500,856 as of January 1, 1917, or $2,199,141 less than the reproduction cost of the properties."

ELECTRICAL CHRISTMAS GIFTS CAMPAIGN INAUGURATED.

Society for Electrical Development Sponsor for Big Trade Movement to Popularize Electrical Gifts.

An electrical appliance is one of the most practical gifts that can be made this Christmas. This is a year of stern reality—useful gifts will be the vogue.

With the view to concerted action in selling gifts electrical, the Society for Electrical Development will conduct a great nationwide campaign this Fall. It will take the place of "America's Electrical Week," which will not be held owing to war conditions.

The Society will announce its big campaign in a broadside to be mailed to the industry on October 10. Every central station, and practically all contractor-dealers will be reached, fully 25,000 businesses. A tremendous effort will be made to have the industry present a solid front in merchandising its wares to the Christmas trade.

Following the broadside announcement, about November 1 an illustrated "how to" booklet will be mailed giving concrete suggestions for selling appliances and how the reader can tie into the great national drive. Members and non-members of the Society will be offered attractively designed window lithographs, window cards, window transparencies, poster stamps, etc., without cost. The official design is now being prepared by one of America's greatest poster artists. It will embody the Christmas spirit—a picture story of the slogan, "Give Something Electrical This Christmas."

Soon after this "how to" booklet is mailed, the Society will send a portfolio of advertising suggestions for newspaper ads, mailing cards, folders, etc., which can be used by all local electrical interests in backing up their display material.

The campaign is not intended to be as big as either "Electrical Prosperity Week," 1915, or "America's Electrical Week," 1916. It will, however, be a real selling campaign from start to finish. Millions of dollars will be spent for Christmas gifts, mostly useful gifts, during the holiday sales period, November 15 to December 24. The electrical industry has never gotten its share of this business. This campaign will provide the opportunity. The Society is recognized as electrical campaign headquarters and it is to be expected that the big movement this year will have the same splendid co-operative service work that made the two big Weeks in 1915 and 1916 so remarkably successful.

SPENDING MORE THAN $1,000,000 AT RIVERTON (KANS.) PLANT.

Revenue of Empire District Electric Company from Oklahoma Fields Increases at Rate of $5000 a Month.

In order to take care of its continually increasing business, the Empire District Electric Company of Joplin, Mo., is spending more than $1,000,000 on new construction work at the Riverton plant. This additional equipment is designed to almost double the capacity of the Empire District Company at that place.

The construction work at the Riverton plant of the Empire District Electric Company is necessitated by the rapidly growing mining field in Oklahoma. It was estimated last spring that by January 1, 1918, about 100 new mills would be in operation and would be using 30,000 horsepower. That this estimate was far too low is shown by the fact that already 150 mills have been constructed.

Since the end of June, the Empire District Company has built two 1500-kilowatt substations in the Oklahoma fields, and estimates have been prepared for two more. The growth of the Empire District's business in the Oklahoma territory is emphasized by its in-

creased revenue. Fifteen months ago, the Empire District's revenue from the Oklahoma fields was $5000 a month. Now it is $25,000 and is increasing at the rate of $5000 a month. Some estimates expect a $75,000 monthly income in the near future. When the $75,000 figure is reached, the income from the Oklahoma field will be as great as the balance of the power district.

Riverton's improvements consist of a complete new boiler house with 14 Connelly boilers of 500 horsepower, two new 300-kilowatt exciter sets, three boiler-feed pumps of 1000 gallons' capacity each, new water softener equipment which is now complete, a 12,500-kilowatt General Electric turbine, already erected, and various other equipment. B. C. Adams, general manager of the Empire District Electric Company, reports that construction work is progressing satisfactorily and it is thought that before the end of October, six of the Connelly boilers will be in service.

The plant which the Empire District Electric Company purchased at Baxter Springs has been shut down and service is being rendered through a step-down transformer substation. This plant was originally run by gas engines. The improvements at Baxter Springs will enable the Empire District Company to pick up a substantial additional load and greatly improve the service. B. C. Adams reports that the revenue at Baxter is about $500 a month and the new-business department feels sure that this figure can be doubled in a short time.

WAR'S EFFECT OF TECHNICAL EDUCATION.

Statistics of Massachusetts Institute Show Registration of 90 Per Cent of Former Years—War Studies Lead in Interest.

Even as early as this Walter Humphreys, registrar of the Massachusetts Institute of Technology, Boston, Mass., has evolved from the registration at the Institute some of the effects of the war on technical education. A knowledge of this is important, since it may help shape lines of preliminary study towards those which the war shows to be in demand. The showing is that chemical engineering is stimulated and naval engineering exhibits an equal or greater increase in students, while civil engineering and electrical engineering remain in about the normal condition.

In the first place, the registration at the end of registration time was between 85 and 90 per cent of what it was last year at the same time. The freshman year shows an increase, the percentage in terms of last year's figure being 104, while the second, third and fourth year classes are, respectively, 93 per cent. 75 per cent and 86 per cent of the number in the school in June.

The graduate students stand today at 60 per cent of last year's figure. There is the most shrinkage in the juniors, the sophomores of last year, to whom two years more of schooling has perhaps seeemed a long time in the face of striking events calling for evidences of patriotism. The return of 86 per cent of the juniors to be seniors is evidence that the junior summer camp was well advised. The purpose of this was to gain some military practice and to give to students an opportunity to anticipate fourth-year studies, and be finished with their studies and ready for active service at an earlier date.

In a consideration of the effect on the courses it may be well to omit those with less than 50 men, since the defection of two or three students makes an undue percentage shrinkage. One of them, however, naval architecture, is stimulated by the war, and the increase is 16 per cent. The course in naval architecture has always been small in attendance and has been maintained by the Institute for a good many years as a contribution to education, in a limited course necessary to round out the complete school.

Of the larger courses, civil engineering maintains practically the same figure as in former years, the shrinkage being 1.2 per cent, while electrical engineering opens the year with a loss of only 2 per cent. Chemical engineering, thanks probably to the advertisement given to it by the war, has 12-per-cent increase. It is interesting to see that engineering administration is practically holding its own, having lost only 6.5 per cent since the last registration. This has always been a popular course, at first, it is hinted, from the fact that the students thought that it might be an easy way to finish at Tech, but latterly from the excellent records that its men have been able to make. It is a little surprising, however, to find that mechanical engineering has lost about 21 per cent. This is a study that should be stimulated by the war, for indeed it is in this work that Professor Miller, head of the department, has undertaken for the U. S. Shipping Board the management of the schools for marine engine-room officers, places in principal ports in the country. The decline in this department is the more surprising in that of the hundred-odd men who have entered the Institute from other colleges, men who have probably looked over the field in engineering needs, it stands second only to chemical engineering in the number of men who choose it for their option. These selections bear out in general, however, the tendencies shown by the full registration, for the favorite options among these men were, in the order named, chemical engineering, mechanical engineering, civil engineering, electrical engineering and engineering administration, with naval architecture next in order. The actual registration presents them in the order, naval architecture, chemical engineering, civil engineering, electrical engineering, and engineering administration. This shows a focussing of popular attention on some of the needed war studies.

Lynn Section A. I. E. E. Opens Season for Series of Lectures.

The Lynn, Mass., section of American Institute of Electrical Engineers will open the season October 10, with a meeting in General Electric Hall, when Stacy R. Burckes, Lynn Police Inspector, will give an illustrated lecture on Bertillon system of reading finger prints. There will also be a debate.

The subjects for lectures this year will to a large extent be modified by war conditions, and will include such as Mastery of the Air; Electrical Signaling in the Army; Cotton, From Staple to Fabric; Atmospheric Nitrogen; The Submarine and Its Electrical Features; America's Part in the European War; Russia, the New Republic, etc.

Among the speakers who have been engaged in addition to Mr. Burckes are Dr. L. H. Baekeland, D. B. Rushmore, Prof. Elihu Thomson, O. D. Young, Walter C. Fish, E. H. Ballard, E. W. Sargent, Col. Samuel Reber, W. R. Balch of the Boston Transcript, and Lieut.-Col. L. Rees of the British Royal Flying Corps.

There is also to be a series of special meetings covering manufacturing problems of meters, motors and turbines, and a study of the materials of manufacture, steel foundry practice and insulations.

NEWS NOTES

Electrical Company Organized in Japan.—The Toyo Electrical Industry Company has been formed by J. Odaka and associates, to manufacture electrical supplies and apparatus at Nagoya, Japan, with a branch at Tokyo.

Portland Utility Company Increases Net Earnings.—The last report of the Pacific Light & Power Company, Portland, Ore., shows an increase of 14 per cent in the net earnings of the company for the month of August, as compared with the same month in the year of 1916.

Power From Texas Lignite.—Texas produces 10,000,000 tons of lignite yearly, valued at about $1 a ton, and the fuel situation has recently led to an investigation of the possibilities of burning this low-grade fuel in a central power plant for generating electricity and at the same time recovering by-products such as tar and tar oils, sulphate ammonia, and solid residue for making briquets. Two methods have been suggested—to distill in retorts or burn in gas producers, using the gas to generate electricity. It is said that when all the energy and by-products in a ton of lignite can be utilized, the Southwest will not only have cheapened its fuel and power but will have gone a long way toward solving some of its industrial problems.

Coal Mines Resuming Operations with Electricity.—The Coronado Coal Company mine at Arkoal, Arkansas, is resuming operations and will be supplied electric power by the Coal District Power Company, which purchases its energy at wholesale from the Fort Smith Light & Traction Company. Practically every mine in the Greenwood District is now operated by electric power furnished by the Fort Smith company. The Greenwood Coal & Lumber Company is now pumping water electrically from its mine and will soon resume operations. This mine has been flooded since last spring when an underground creek was encountered.

Luncheon Given Australian Premier.—A luncheon was given recently at Gotham Hotel, New York City, by Lord Northcliffe in honor of William A. Holman, prime minister of New South Wales, Australia. Lord Northcliffe presided, and introduced the distinguished guest as one of the great men of the British Empire. Premier Holman responded in a notable address, stating that to Australians the friendship of the United States was valued as one of their most precious assets. Mayor Mitchel delivered a brief address, welcoming the prime minister. Sir Edward Morris, prime minister of Newfoundland, also addressed the gathering, paying a tribute to Australia. The luncheon was attended by about 200 persons, among them many women. Those present included Mayor John Purroy Mitchel, Sir Edward Morris, Premier of Newfoundland; Rear Admiral Bradley A. Fiske, U. S. N.; Colonel John J. Carty, U. S. A.; Alton B. Parker, R. Fulton Cutting, A. C. Bedford, Melville E. Stone, Sir Frederick Black, George T. Wilson, T. P. O'Connor, General White of the British Army, Clive Bayley, the British Consul General, and C. W. Price, president of Electrical Review Publishing Company.

Muskogee's Increased Use of Electric Power.—During the month of August the New Business Department of the Muskogee Gas & Electric Company, Muskogee, Okla., under the supervision of F. A. Strassweg, secured new business including 173½ horsepower in motors and 112 household electric appliances. The Yahola Sand & Gravel Company, at Fort Gibson, has increased its power capacity from 75 horsepower to 100 horsepower.

Radio Engineers Hold Meeting.—Institute of Radio Engineers held a session October 3 in Engineering Society Building, New York City. The feature of the meeting was a paper on Radio Telegraphy in Competition with Wire Telegraphy in Overland Work, by Robert Boyd Black of the U. S. N. R. F. In this paper the extension of the use of radio communication was critically considered, and its future developments were discussed.

San Francisco's Proposal to Buy Street Railway.—Board of supervisors of city and county of San Francisco has approved a plan for the purchase of the street car lines of the United Railways of that city and has directed the city engineer to make an estimate of the valuation of the properties. After these data have been secured the entire proposition is to be formulated and submitted to the voters of the city for acceptance or rejection. These lines amount to two-thirds of all the trackage in the city.

Court Upholds Electric Patents.—A decision affecting the validity of patents held by the Consolidated Railway Electric Lighting & Equipment Company against the Ford-Oliver Company of St. Louis, has just been handed down by the U. S. Circuit Court at St. Louis. The decree of the court was in favor of the plaintiff, a subsidiary of the Car Lighting & Power Company and awards damages for infringements to be computed after an accounting. Patents alleged to have been infringed are for an automatic switch and for a battery connector, used extensively in car lighting systems.

Valuation of Idaho Power Plants Are Increased.—The valuation of power plants and electric transmission lines in the state of Idaho owned by small corporations and individuals was increased $104,000 over last year by the State Board of Equalization. The valuations of properties of the Utah Light & Power Company, the Washington Water Power Company and the Idaho Power Company were increased to the amount of $3,339,310 over last year. The total valuation of all power plants and electric transmission lines was fixed at $14,209,750 by the board. Last year valuation on the same property was fixed at $10,927,207.

Edison Section N. E. L. A. Holds Annual Election.

Commonwealth Edison section of National Electric Light Association, Chicago, held its annual election in Edison Building September 25, in which 505 votes were cast. There were two tickets in the field and the contest of ballots was keen, due to spirited electioneering. The result was as follows: President, A. G. de Clercq, assistant construction superintendent; vice president, W. L. Sees, overhead foreman southern district; treasurer, William A. Fox, vice president Commonwealth Edison Company; secretary, Ernest S. Butt, assistant editor of *Edison Round Table Weekly* and *Electric City Magazine*. The retiring president is William S. Kline. The past year has been one of the Section's most successful ones.

Notes on Commercial Practice

New-Business Methods, Policies, Rates and Kindred Central Station Matters for the Man Engaged in Selling Electricity

Louisville Company Advertises Its Independence of Coal Situation.

The Louisville Gas & Electric Company, which recently gave out a statement as to its arrangements to insure a sufficient supply of coal at its Waterside plant in Louisville, did not overlook the advertising advantages in this connection. Local newspaper advertising described in general terms these measures and concluded as follows:

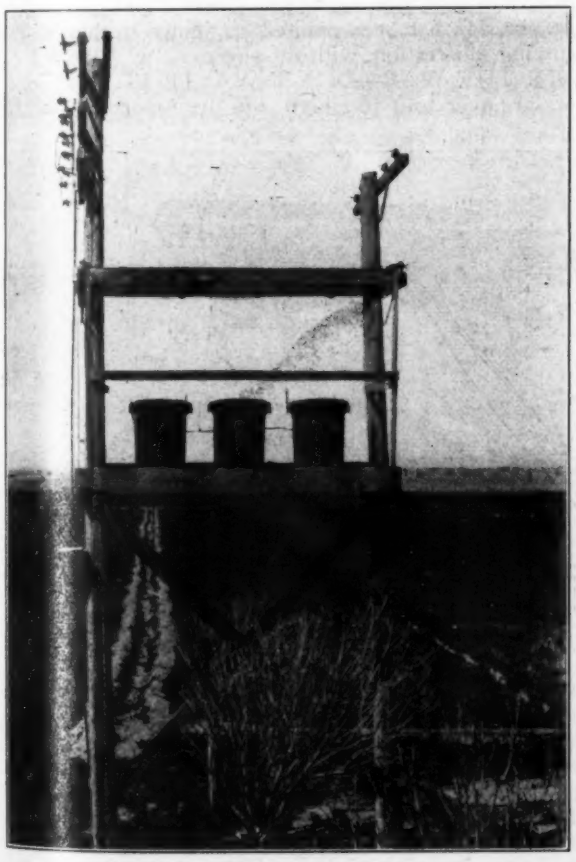
"In short, Louisville has an electric generating station second to none in the United States. Now that the station has an abundant and sure supply of coal, the people of Louisville can feel that whatever else the war takes away from them or renders scarce, their supply of electricity is safe and abundant so long as the railroad can run trains to carry fuel.

"The people of Louisville have long recognized the necessity for increasing and developing the city as a manufacturing center. The people raised a million dollars for this purpose and established the Louisville Industrial Foundation. Certainly there is no other factor tending to make the city a desirable spot for manufacturing enterprises which should receive a greater consideration than the fact that an abundant and sure supply of electric power is available at prices as low as those obtaining in any other city—not even excepting those cities which are near water powers.

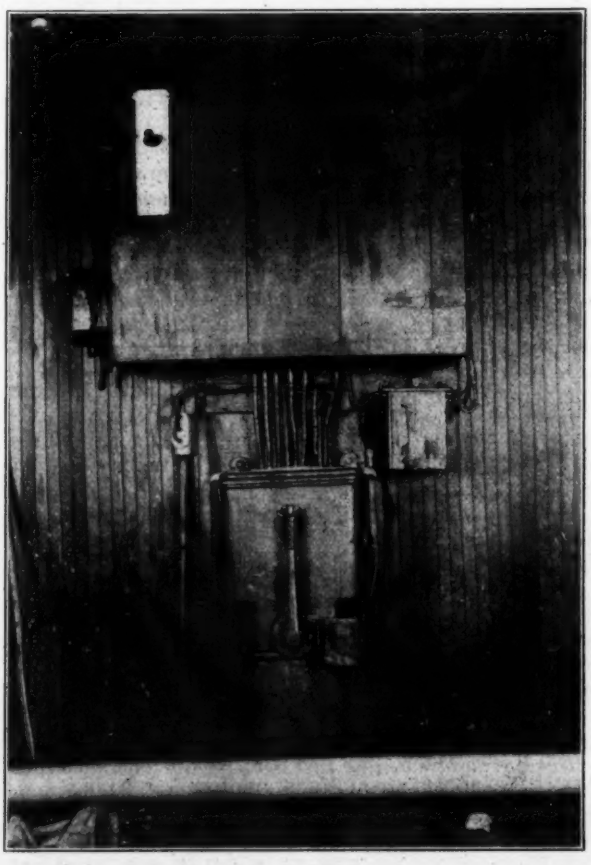
Central Station Supplies Energy for Irrigation in Land Development.

It is not too much to say that much of the present increase in tillable lands in southern California is due to the availability of electricity as a cheap and convenient source of pumping power. The network of central-station lines above ground, and abundant water from 15 to 150 feet below have literally made the desert blossom as the rose.

In Ventura County, California, is located the quarter section of the Berylwood Investment Company. Of this, 120 acres is farmed. The soil is the heavy black sort locally called "adobe." In developing a property such as this, a careful survey is made to determine the existing water-sheds. The property is then graded if necessary so that there are one or more

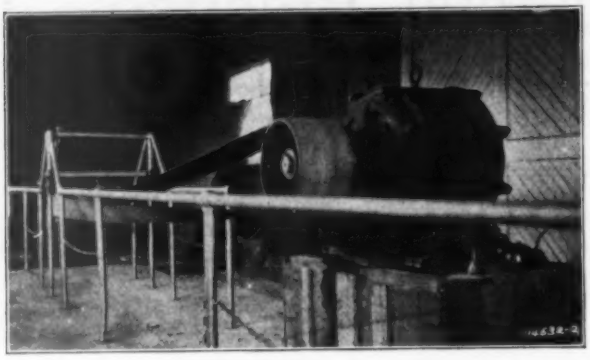


Transformer Installation for Irrigation Pump Motors of 50-horsepower and Up. Pacific Light & Power Company.



Meter and Protective Panel for Motors Driving Irrigation Pump, Pacific Light & Power Co.

"peaks" from which water will flow gently down ditches and laterals. Here a single pump was installed at the highest point. It is of the turbine type,



50-horsepower Westinghouse, 2200-Volt Moter Driving Turbine Pump.

capable of delivering 73 miners' inches, and is driven by a 50-horsepower Westinghouse induction motor, supplied at 2200 volts by the Pacific Light & Power Company.

But two crops are raised—say beans and alfalfa. Water is supplied by trenches once each year for the beans. The alfalfa area is divided into sections by low mounds. After each cutting, of which there are 4 or 5, these sections are flooded with water to a depth of 2 or 3 inches. When the pump is running it usually means 24 hours a day—hence an excellent load for central station service.

The meter and control installation is one specially designed by the power company to avoid all risk to the operator. In a box above are mounted the main-line oil switch, watthour meter and its transformers, while just below are the overload relay and auto-starter. A wooden platform affords additional safety.

For installations at lower voltages, transformers are located on poles, either on cross arms, plants (up to 50 horsepower) or on platforms (above 50 horsepower). Disconnecting-type switches and fuses are installed on the high-tension side.

An idea of the revenue from irrigated land is given by the value of this year's bean crop—$9000—and the value of one cutting only of alfalfa—$1500.

A Forceful Electric-Range Argument.

The following letter, which was prepared by the Society of Electrical Development for a large manufacturing company, brings out some pertinent thoughts on electric cooking, which can well be taken to heart by central-station companies:

"You know and I know that this war must end victoriously for our nation—our purpose is too big and righteous to fail. We must win! And you know, as I do, that the successful termination of hostilities will bring to American industries and commerce the greatest boom in their history. America will have to work overtime supplying the demands of the rest of the world.

"Right now many are momentarily depressed because son or brother has gone to fight; because expenses have gone up; or just because our entrance into war has found them unprepared. There's where you and I come in.

"Let's not sit back and calmly view this condition. Let's up and at 'em! Grab your electric torch of optimism and dispel the gloom. Show the fearful one the folly of the pessimistic spirit and false economy. Demonstrate the great advantages of keeping money in circulation by sane buying.

"Eating less food, for one thing, is essentially wrong: It tends to jeopardize the vitality which will be so necessary when the country makes its bigger demands on our industrial man-power. But conservation of food is essentially right. And there's where electric ranges come in.

"Don't let any one tell you that ranges are expensive, and get away with it. Show them how the heat of an electric range is conserved and centralized right where it is needed. Tell them of the saving of time and worry that is spared where no matches are needed and children are not in danger.

"Demonstrate the cleanliness of the range. And close with that all-important item at this time—the fact that meats suffer less shrinkage when cooked electrically. Right there is a lesson in conservation. Not only is there MORE food left after cooking—but the BEST parts of the meat, the strengthening values, are not evaporated.

"So your duty is clear—plug harder than ever, not to sell the electric range, but to sell the electrical cooking idea, and not only that, but to place a feeling of optimism in the minds of those you call on. Remember, from a purely commercial standpoint, there is nothing depressing about the war—its outcome positively MUST be to the best interests of business.

Brooklyn Edison Company Donates Sign to Food Conservation Cause.

Co-operating with the very excellent work of the Food Administrator, Herbert C. Hoover, the Brooklyn Edison Company has given over its large illuminated billboard sign located at Times Plaza, Brooklyn.

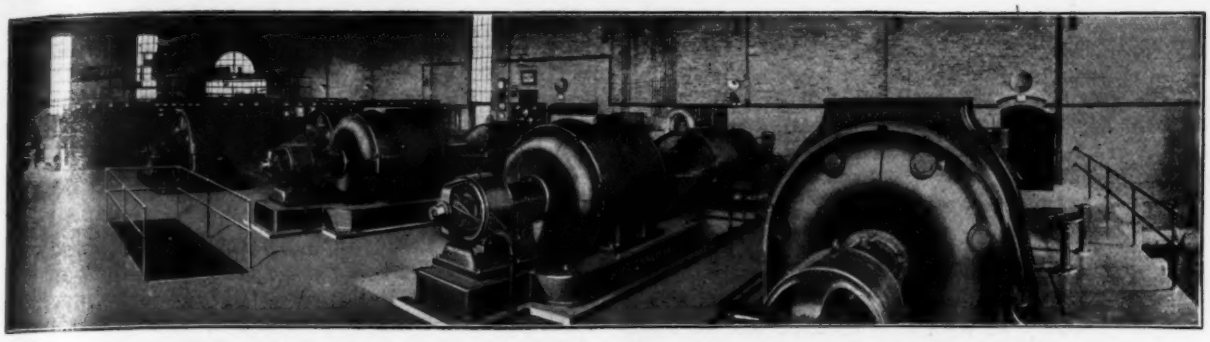
The sign has been painted, as shown in the accompanying illustration, with the slogan: "FOOD WILL WIN THE WAR—DON'T WASTE IT." The letters are over four feet high, and the American shields,

Illuminated Billboard Donated by Brooklyn Edison Company to War Cause.

approximately 6 by 10 feet. The border is in red, white and blue.

This is considered one of the busiest spots in Brooklyn, and it is estimated that 300,000 people pass this point daily.

The fact that this sign is in constant use by the Brooklyn Edison Company, advertising the sale of electric light, power and appliances, makes it an especially valuable addition to the food-conservation work.



Modern Power Plant at Gallaway, Iowa, Equipped With Steam-Turbine Units Aggregating 6000 Kilowatts.

Notes on Operating Practice

A Department Devoted to Practical Problems of Plant and Operating Practice With Particular Reference to Electrical Generation and Distribution

SUGGESTIONS FOR STORING COAL.

Advantages of Underwater Storage—Methods of Guarding Against Spontaneous Combustion.

By Lionel Linnell.

Abnormal industrial activity, a coal shortage due to labor troubles, congested trackage and car shortage in face of unprecedented demand, and a threatening cold spell makes the problem of obtaining coal an all-absorbing one for the consumer of coal. Once enough coal is obtained to guard against all possible contingencies, the next problem is where and how to store it so that it will be fit and available for use when it is needed, and with as little deterioration as possible.

Space for coal storage is often difficult to find, because the location chosen should be one that readily permits of coal being delivered and collected at low cost and with little delay; it must be where the coal is safe from theft, and where it can be watched to a certain extent, to preclude its destruction by spontaneous combustion. Most public utilities possess coal-storage yards in close proximity to or not far distant from their power houses or point of consumption. Some of these consist merely of large spaces that are covered with coal, others are expensive concrete basins that permit of being flooded with water.

Under-Water Storage.

The under-water storage of coal though costly has the advantages that spontaneous combustion will not occur, nor will the coal deteriorate due to weathering. Although perhaps not justifying its cost under-water storage might be utilized to good advantages in times of emergency or otherwise where it costs little to do so. At Summit, which is about 25 miles outside of Chicago, on the Chicago & Alton Railroad, a number of discarded stone quarries were last year used for coal storage. These quarries are located alongside spur tracks. Coal cars were brought to the mouth of the quarries, which are about 25 feet in depth, and dumped. The coal was then shoveled into the quarries until within two to three feet of the surface. The remaining space in the quarries was filled with water, which covered the coal completely. Many of the quarries were full of water before dumping in the coal, upon which the water was displaced, which saved the trouble of pouring in water afterwards. The stone quarries were used originally when a nation-wide railroad strike threatened, and afterwards the coal was removed as needed by suitable suction pumps. It is possible that discarded stone quarries elsewhere might be usefully employed at this time for the storage of coal by utilities, municipalities and others, for it is a way of obtaining under-water storage at a minimum of expense or delay.

Using Railroad Embankments.

Extensive coal-storage facilities within city limits, which is what the average central-station company desires, are difficult to obtain. Some large companies who have already utilized to the full their normal storage space are doing something that might also be done elsewhere. They are using the embankments along their railroad tracks for coal storage. The coal is dumped out of cars and allowed to fall or is shoveled down the embankment manually or by steam or electric shovels. Finally the sides of the embankment and its width at the top become so increased in width that the existing track can be moved bodily over toward the edge of the existing embankment of coal, or an additional track laid down and the procedure repeated. In one case lump coal is being thus stored for about ¾ miles at a height of about 20 feet and to an eventual width of eighty feet if the coal can be obtained. Quite a large quantity of coal can be piled up in this way occupying space that would not otherwise be utilized. Moreover in thus doing it cars are not long detained for unloading, and the coal is stored where it can be easily dumped and as readily re-loaded.

Preventing Combustion.

Although the chief problems confronting the consumer of coal at the present time are to obtain coal and where to put it when it is obtained, another problem, namely, how to keep it, may present itself if due precautions are not taken. Loss of coal from

combustion in the storage piles must always be taken into consideration if a feeling of false security is not to exist, and every effort made to prevent fires, not only for the actual pecuniary loss, but because coal obtained now may stand between shutdowns later on in the year. That precautions should be taken is emphasized at this time on account of the large fires that recently occurred in the 171,000-ton coal pile at Gary and a 150,000-ton pile in Indianapolis.

A fire in a large coal pile may be intentional or accidental. If intentional it is the work of an incendiary, a matter that assumes an added importance with the country at war, if accidental due to spontaneous combustion. However, the damage wrought by an incendiary should ordinarily be small. A large coal pile is not readily ignited, even when oil and wood are used to start combustion. The fire must be started at the surface of the pile which usually is sluggish in igniting because the surface even after but a short period of weathering slacks and crumbles to a depth of from 6 to 15 inches, and then becomes slow-burning. The rapidity with which the fire spreads depends upon the direction and velocity of the wind. Moreover a fire lighted in this way is usually extinguished without trouble. The fire spreads over the surface of the pile where water can be played upon the burning coal; or other coal can be thrown upon the burning mass, thus smothering or quenching it. The way to prevent incendiarism is to employ watchmen, and preferably assist them at night by flood lighting, where the size of the coal pile justifies. Flood lighting economizes in guards and tends to discourage miscreants.

Fires due to spontaneous combustion are usually more disastrous in effect and likewise more difficult to extinguish. The fire is not readily accessible being inside instead of on the outside of the coal pile, nor is the actual location of the fire always easily determined for the smoke that filters through the coal may be very deceptive. As water can not always be used to good advantage nor with any assurance of success it is usually necessary to dig the coal out until the burning portion of the pile is bared.

Preventive Measures Recommended.

Fires from spontaneous combustion are largely preventable, hence the high value of coal just now, and the adoption of storage by many not thoroughly conversant with the precautions may justify a brief review of how to safeguard the coal pile. It is usually recommended that a coal pile not exceed 12 feet in height where the coal is stored above ground. However, if proper precautions are taken this height may be exceeded with little danger to 15 or 20 feet. Lump coal should be used where feasible for storage, the presence of large amounts of dust being favorable for spontaneous combustion. The popular impression that ventilation of a coal pile is a protective measure is a fallacy; in fact air should be excluded. One move in this direction is not to allow the large lumps of coal to fall or roll down to the bottom of the pile or embankment, the smaller and lighter aggregates and dust remaining on top, for this enables air to enter at the bottom, and air contains oxygen, which is necessary for combustion. Distribute lumps and finer aggregate evenly therefore. Coal newly mined seems to have a tendency to heat more rapidly when stored immediately than the same coal that weathers for a few weeks, a fact worth remembering at this time when vast quantities of coal are going into storage direct from the mine. Although this cannot be helped, for immediate storage is particularly desirable at this time, the latent danger can be greatly reduced if it is borne in mind that coal showing a tendency to heat if moved or handled so as to permit it of cooling will rarely tend to heat again in the future. The wisdom of re-handling the coal, and especially that which has been newly mined, about eight weeks after being first stored is thus apparent.

Sufficient Warning of Fire Given.

Fires in a coal pile due to spontaneous combustion do not occur suddenly, nor need they if the warning is heeded. The interior of the pile gradually increases in temperature, slowly at first and then more rapidly. Fires can therefore be prevented if the heating coal is cooled before combustion takes place. The simplest preventive measure consists of watching the internal temperature of the pile so that if heating occurs or appears to be increasing the remedy can be taken. Prevention is better than cure in dealing with combustion in a large coal pile, because it can be done cheaply; in fact prevention must in this case always be cheaper than the cure. A very simple and inexpensive method of protecting a coal pile—the cost is so low that it can be done for the smallest pile to the largest—consists of maintaining thermometers placed at regular and judicious distances throughout the pile. This can be done by driving into the pile at about every twenty-five feet a 1-inch gas pipe, which is sunk into the coal until it reaches the surface of the earth; or which is placed and the coal piled round it. Into these pipes thermometers are inserted by means of a piece of string. The gas pipe should preferably protrude above the top of the pile about one foot. By letting the thermometer down any depth the temperature at that depth is readily determined and readings of temperature made regularly enable the internal temperatures throughout the pile to be watched and recorded. Should pronounced heating appear to be developing at any section of the pile the hot spot can be dug out before a danger arises and the coal pile threatened. In passing it might be pointed out that alternate heating and wetting, such as occurs after summer rains, is very favorable to spontaneous combustion, hence where thermometers are installed it may be well to watch the pile more carefully during such times.

The coal pile represents today a cash value never perhaps exceeded. Possibly before long the coal pile may stand between shutdowns and calamities and thus prove a national asset beyond belief. While prevention is usually better than cure, in the case of a burning coal pile there is no cure since coal that is burnt is coal lost forever. Surely, therefore, if effective and simple precautions can be taken and at very little expense they should be taken without delay.

Steam Jet Ash Conveyor to Make Big Saving at Lorain.

The Lorain (O.) County Electric Company has recently closed a contract with George J. Hagen & Company of Pittsburgh, for a steam jet ash-conveyor system. This system will be used in connection with type E stokers which are being installed.

The present method of handling ashes is by wheelbarrow. Two men are employed continually on this work, and the labor cost per ton of ashes handled averages $1.25, according to estimates which have been prepared.

The cost of operation with the new system installed, including labor, steam used and maintenance, will be, according to the estimates, 33 cents a ton of ashes handled.

PITTSBURGH COMPANY BUILDS 200,000-TON COAL-STORAGE PIT.

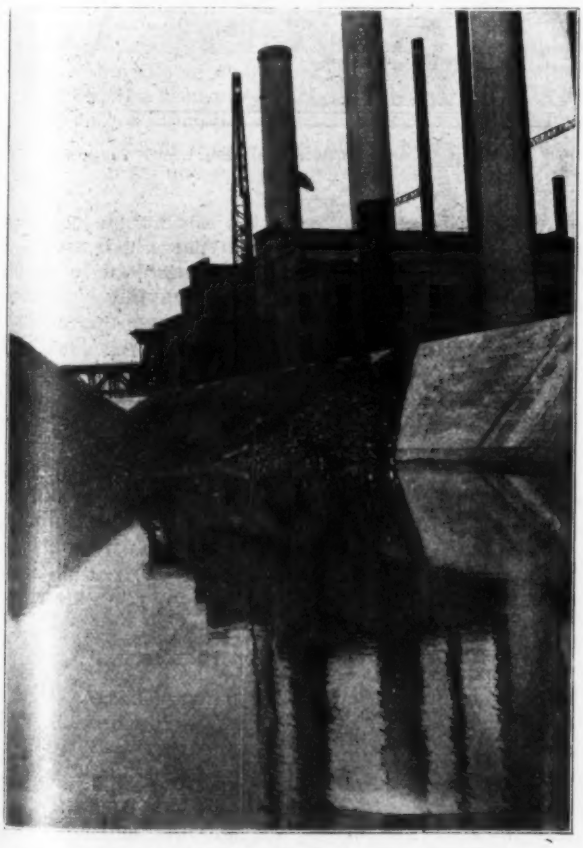
Coal Situation Makes Storage Facilities Desirable—Provisions Made Against Spontaneous Combustion.

The Duquesne Light Company of Pittsburgh will not be troubled hereafter with fire in the coal storage. The possibility of spontaneous combustion has been eliminated by the construction of the largest submerged coal basin in the world—capacity 200,000 tons, submerged.

In speaking of the necessity for this improvement to the Brunots Island Station, W. A. Butter, assistant superintendent of the station, remarked:

"If you had seen the fire we had some time back—seen it steadily eating up hundreds of tons of coal, you would not be surprised that we are taking this step to prevent such a disastrous thing in the future. It was almost impossible to put out the fire, although oceans of water were pumped into the burning pile. You see, coal as it is ordinarily dumped on a storage pile, automatically forms itself into a very good furnace. The buckets leave it heaped up in a cone-like form. The coarse particles tend to roll outward always, forming in upward extending strata with the fine stuff between. And there are formed regularly distributed air passages, which create a fine draft."

The following notes, secured through the courtesy of Mr. Butter, F. Uhlenhaut, the chief engineer of the

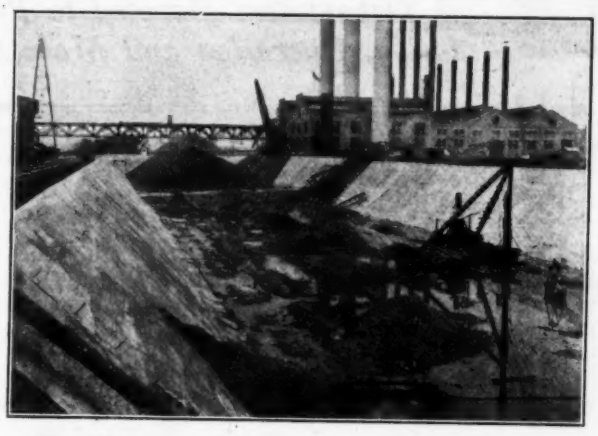


Under-Water Coal Storage Pit of Duquesne Light Company.

company, and representatives of the Duquesne Contracting Company, Pittsburgh, give a fair idea of the construction of the big basin.

It is located adjacent to the 63,000-kilowatt generating station on Brunots Island, between two channels of the Ohio River.

The pool level is on a level with the river. Four connections, shafts, are made with the river. There are valve wells in the bottom, containing both gate and



Construction View Showing Size of Pit—One-half in Use.

check valves. These inlets are operated with the valves open all the time.

From the accompanying illustrations it will be seen that through the center of the basin is a discharge tunnel used to conduct water from the condenser discharge back into the river. It has no connection with the basin itself, but it does form a partition dividing the basin into two sections about eight feet in depth. This made it possible to use one-half the basin for submerged storage while the other half was being constructed. Running through this tunnel are also four 12-inch connections for filling the pit by means of the circulating pumps in the power station when the river is at low-water stage.

The side walls are at a 45-degree angle, curved at the bottom. They are 18 inches thick at the bottom and eight inches thick at the top, reinforced with steel bars and expanded metal.

The floor of the basin was constructed in sections about 40 feet square, separated by transverse and longitudinal curb-walls 18 inches high. The floor sections are separated from the curb walls by pitch and tar paper joints to allow for expansion and contraction.

The side walls were done in sections the same width as the floor sections, by means of a traveling form, as shown in one of the illustrations.

As it stands completed, the basin is served by one Link-belt electrically operated crane of a capacity of 175 tons per hour, with a 110-foot radius, and one 50-ton Link-belt locomotive crane on the opposite side of the pit.

The larger crane dumps direct into the reclaiming tower.

Steam Turbines at Gallaway, Ia.

The illustration shown at the head of this department is from a photograph taken in the plant of the Waterloo, Cedar Rapids & Southern Railway, Gallaway, Iowa. The generating units consist of steam turbines driving two alternators of 1500-kilowatts capacity. They are wound for 25 cycles, 2300 volts and operate condensing at 1500 revolutions per minute were furnished by the Allis-Chalmers Mfg. Company, Milwaukee, Wis.

Electrical Construction Notes

A Department Devoted to Problems Relating to the Installation, Operation and Maintenance of Electrical Equipment

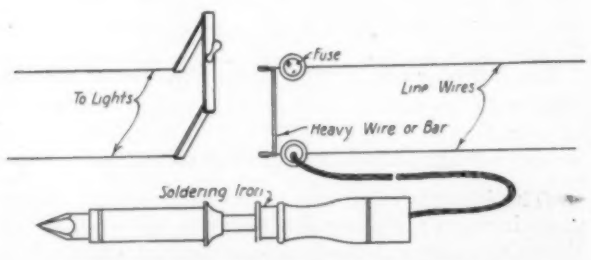
Impregnating Asbestos Lumber for Panelboards.

BY H. E. WEIGHTMAN.

The use of asbestos lumber is increasing for panelboards, control panels and the like. To make this material somewhat more or less attractive, it is desirable that it be given a good finish. This can be done in the following manner:

The cut and drilled pieces when ready for assembling are dried one hour in an oven at a temperature of 240 to 280 degrees Fahrenheit. As soon as possible after being removed from the oven and at any rate not exceeding 30 minutes thereafter the pieces should be impregnated in a standard No. 1 asphaltum compound. This is a quick-drying, glossy paint, free from all coal tar and without the usual disagreeable odor that is peculiar to the poorer asphaltum compositions. The melting point of this compound is about 200 degrees Fahrenheit. Provision must be made in the tank to keep the pieces from contact with each other and from the sides of the tank. The pieces are left in the tank for a period of 15 minutes and on removal they are wiped clean with a cloth. After the parts have become thoroughly cooled to ordinary temperature they are given a coat of orange shellac. By following this method carefully a very good finish is obtained for this material, which deserves more extended use because of its safety and durability.

Emergency Connection for Electric Soldering Iron.—In taking a new position recently in a shop where there was much rewiring and new wiring to be done, I found I was handicapped by the comparatively few outlets to which an electric soldering iron could be connected. When working near a lighting cabinet or panelboard I hit upon the scheme illustrated. It consists simply in an emergency connection to one of the plug-fuse receptacles, the line being temporarily short-circuited by means of a bar or heavy wire fitting into the clips of the switch. The other fuse must, of

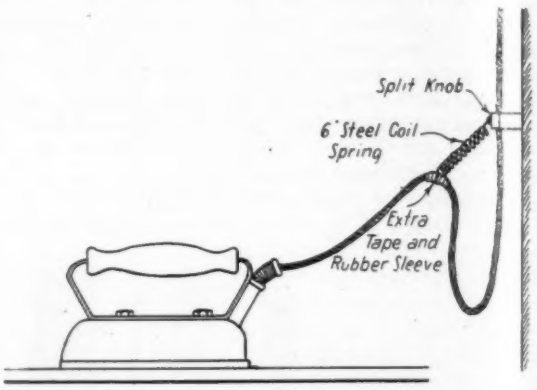


Temporary Connection for Electric Soldering Iron.

course, be left in place. This is a very quick and easy means of making such an emergency connection. When through using the iron the fuse must be replaced in its receptacle and the short-circuiting bar removed.

FRANK BOONE.

Cord Adjuster for Electric Flatiron.—When using a flatiron the cord is frequently troublesome because it drags over the ironing board and is apt to get in the way. To overcome this difficulty, I have found



Simple Cord Adjuster for Electric Flatiron.

it convenient sometimes to use the simple cord adjuster shown in the accompanying illustration. It includes a six-inch flexible spring secured to a split porcelain knob. Of course, this is applicable chiefly to cases where the iron is in continuous use, such as in a tailoring establishment or laundry. The knob affords a good support for the cord. Where the coil spring is fastened around the cord the latter should be first protected by means of a rubber sleeve, on top of which extra heavy tape is wound. This method of supporting the cord has been found to avoid the frequent bending near the plug, which causes the cord to wear out quite rapidly. The spring allows sufficient freedom for the operator to use the iron without cord trouble and takes up the slack in the cord at all times.

M. J. MORIARTY.

Among the Contractors.

The Johnson Electric Company, Wausau, Wis., is establishing a branch at Rhinelander, where B. Ahlman of Wausau will be local manager.

Henry J. Rueff and others, of Louisville, Ky., have incorporated the Henry J. Rueff Company, with capital stock of $10,000, to engage in a wholesale and retail business in electrical supplies and fixtures.

Gary Electric Company, Gary, Ind., has incorporated with a capital stock of $5000. The company will buy and sell electrical fixtures. David L., Lloyd B., and Vaughn O. Snowden are directors of the new organization.

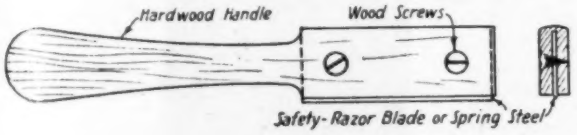
USEFUL WIRING HINTS

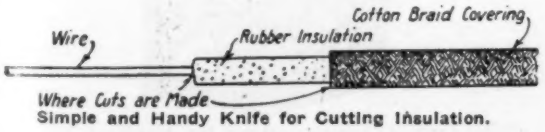
A collection of some short-cut or otherwise valuable suggestions which, though not entirely new, are not as well known by wiremen as they deserve to be. Most of these suggestions have been submitted for publication as "Dollar Wiring Kinks," which department is intended for new and original ideas only and will reappear soon.

Protecting Slate Linings in Shipment.—In shipping side linings of either slate or marble which are to be used for panelboards, there is often a considerable loss by breakage, especially in the larger sizes, 36 inches or over. These linings are usually but one-half inch thick and are very frail and easily broken by the least rough handling. By using a board of any cheap wood, such as pine, and fastening a lining piece by twine on each side of the board or, if the linings are drilled, by using a screw in each end, this will stiffen the lining and lessen the likelihood of receiving broken slate or marble. H. BARNUM.

How to "Stretch" a Wire that Proves to Be a Little Short.—It often happens in changing a switch or outlet on existing wiring that the wires are found to be a little short for the new location and the short splice will not look neat. This is especially true in changing the wiring for motors, which is frequently necessary in a large shop. To overcome this I have found that a lug can easily be made from copper tubing of the proper size and length. The tubing should be of equal carrying capacity to the wire itself and should be securely soldered to the wire end. After connecting it may be taped right up to almost any switch or terminal and make a neat and entirely satisfactory joint. ARTHUR S. NICKERSON.

Knife for Safely Cutting Cotton-Braided Wire.—When removing the cotton braiding on weatherproof wire where waterproof joints are to be made, one is apt to cut through the rubber insulation and sometimes even into the body of the wire itself, if an ordinary jackknife is used. I have seen many inferior joints due to this. When I make a joint that is to be waterproofed I first cut through the cotton outer braid by means of a special knife, shown in the accompanying sketch. This consists of a simple handle with a slotted end. This slot is just wide enough to receive an old safety-razor blade. The slot can be made by cutting into it endwise with a saw. Ordinary wood

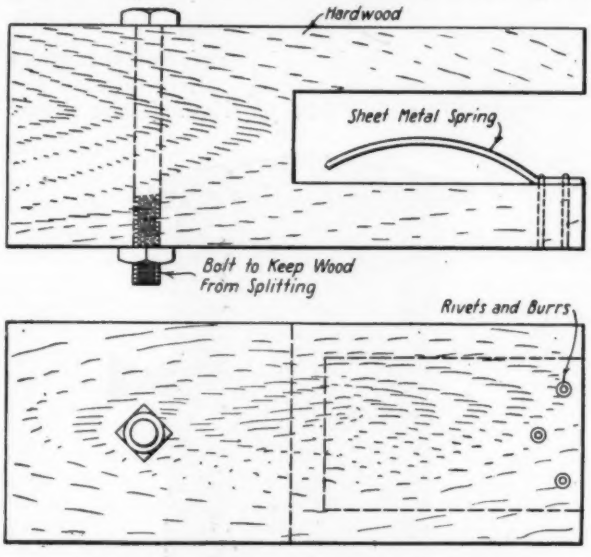




Simple and Handy Knife for Cutting Insulation.

screws can be used to hold the razor blade in place, the latter being first drilled to receive them. The edge of the blade must project only just enough to permit cutting through the outer insulation without cutting into the rubber. If no razor blade is at hand almost any piece of spring steel can be ground to have a good cutting edge. This knife is very easily made and is a very useful tool where many joints are to be made. It makes a very neat cut. It can also be used to cut through the rubber insulation, so as to expose the wire itself. After making the joint and putting on the rubber tape a satisfactory water-tight joint is obtained. A. GEMMELL.

Clip for Door of Terminal or Test Box.—In making tests on terminal or test boxes used on poles in connection with telephone cables and the like, it is very annoying to have the wind keep knocking the



Door Clip or Holder for Terminal or Test Boxes.

door against one. To overcome this trouble I have made a simple holder or clip, such as shown in the accompanying sketch. It can be slipped onto the side of the box, when the door is opened and makes a convenient stop for the door. It is very light to carry in the tool bag and will be found quite useful and well worthy of the trouble of making it. The bolt passing through one end is used merely to keep the wood from splitting. A spring used in the open jaw keeps the clip or holder in place. It can be fastened with ordinary rivets. A. GEMMELL.

Emergency Porcelain Subbase.—When working on a wiring job where it is necessary to use a subbase for a wall receptacle or switch one is likely to find that he has forgotten to bring this along with his material. Instead of making a special trip back to the shop, use can be made of porcelain knobs that usually are at hand. Take the top pieces of two two-piece knobs and place them under the wall switch or receptacle so that the holes will match correctly. This forms a neat, handy and secure subbase. FRED MORROW.

Installing New Strain Insulators.

In using suspension insulators for dead-ending high-tension lines, as is frequently done by central stations, it often happens that these insulators break down. In taking the splice apart to insert it in a new insulator the hard-drawn copper usually breaks. Instead of taking the splice apart, it is preferable to saw the eye out and put a three-eighths-inch chain shackle between the splices and the new insulator.

B. R. SHUTT.

New Electrical Appliances

A Review of the Latest Developments and Information Respecting Electrical and Kindred Mechanical Appliances

New Combination Fuse and Primary Disconnecting Switch.

The proper protection of transformers requires that a primary fuse and preferably also a primary disconnecting switch should be provided. These should

Fig. 1—Front View of Fisher-Chase Fuse and Disconnecting Switch.

be mounted in a separate primary cutout box close to the transformer. These needs are very well met in the combination fuse and disconnecting switch placed on the market by the Fisher-Chase Manufacturing Company, 118 Parsons Avenue, Columbus, O. The accompanying illustrations give a pretty good idea of the arrangement of this device. The outfit is mounted in a substantial box, at the right side of which there is a pull knob, by means of which the fuse can be pulled out of its contact clips and thus the circuit opened. It will be observed the removal of this fuse, which is mounted in a holder so as to engage knife-

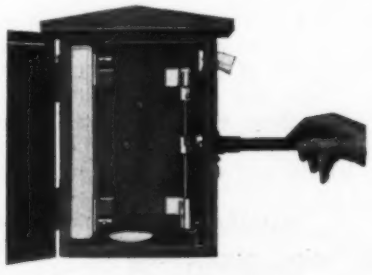


Fig. 2—Method of Breaking Contact.

blade clips, acts also as a switch. On the bottom of the box is a telltale with a large white disk, surrounded by black surface, so that the lineman can quickly observe it, not only by day, but by night by means of a flashlight directed upwards against the bottom of the box, so as to avoid climbing the pole for this purpose. In back of the box is a special hanger constructed so as to permit the box to be quickly attached to standard crossarms. These devices are built for all primary distributing voltages up to 6600 volts and are provided with fuses from 1 up to 100 amperes. They serve as a valuable means of insuring safety to the lineman and enable him very quickly to replace a primary fuse without rubber gloves, tongs or sticks, and without any danger in the operation.

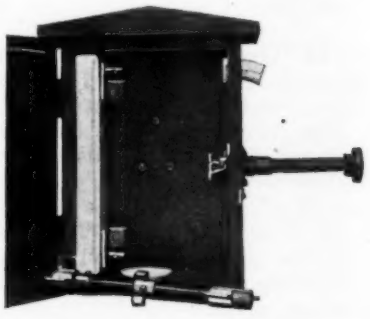


Fig. 3—Switchbox Open, Showing Cartridge Removed.

The accompanying illustrations show the construction of this device and its operating features. Fig. 1 is a front view of the switch and illustrates how the handle is safely out of the danger zone with the door closed. Fig. 2 shows how the perfect breaking of both contacts is made from the outside with the door closed. Fig. 3 shows the cartridge removed in safety for re-fusing in a few seconds. Fig. 4 shows the special hanger construction for attaching crossarms.

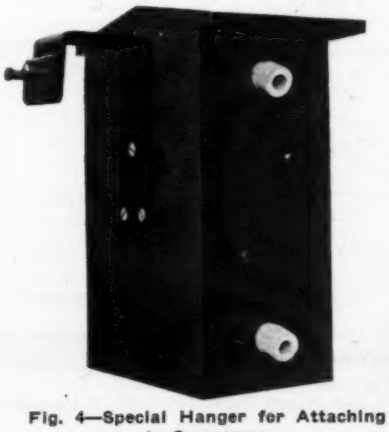
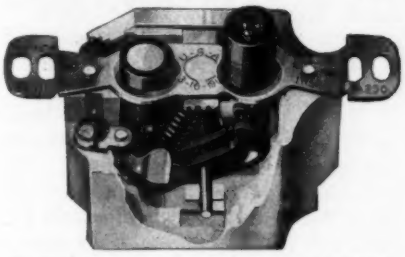


Fig. 4—Special Hanger for Attaching to Crossarms.

During the past two years the Fisher-Chase switches have been thoroughly tested in actual service, under all kinds of conditions, and they have met all requirements.

Gordon Push-Button Plush Switches.

"Gordon Quality Products" is the trademark recently adopted by the new board of directors of the Gordon Electric & Manufacturing Company, now located at 430 South Green street, Chicago. A com-



Gordon Single-Pole Push-Button Switch.

plete reorganization of this concern took place a few months ago, and the general management is now under the direction of the new president, Ira R. Seltzer, whose experience in manufacturing and selling materials closely connected to the electrical field covers a period of years. This firm now occupies a modern daylight factory, completely equipped for producing electrical wiring devices and specialties to advantage. Its force is made up of high-grade mechanics thoroughly familiar with mechanical and electrical problems.

The company's main line at the present consists of the Gordon push-button flush switches, which are made in the single-pole and three-way type. The principle of these switches, as can be seen from the accompanying illustration, is radically different from any other switch on the market, so much so that the company was able to get basic patents on its various features. Simplicity is the foundation of the switch, and a few simple parts, easily adjusted and controlled, make it a very practical and durable device.

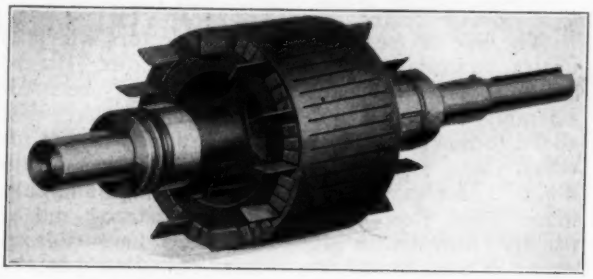
Both the No. 100 single-pole and No. 300 three-way switches are thoroughly approved by the Underwriters' Laboratories, and are manufactured under the Underwriters inspection and label service. The new three-way type, having the two-piece insulating contact, has successfully gone through what are said to have been the most severe tests ever attempted on a switch of this kind. An elaborate endurance and overload testing machine is in constant operation and every switch is tested under an actual load before it is shipped, thereby making it possible to guarantee every switch to be mechanically perfect. A very attractive box, in two colors, is being used for packing the switches, which is itself an attractive feature for the jobbers.

A New Small Squirrel-Cage Induction Motor.

A new line of induction motors has recently been placed on the market by the Crocker-Wheeler Company, Ampere, N. J. These motors, known as the C.-W. form P motors, are of the squirrel-cage type, ranging in size from one-half to three horsepower, and are designed for constant-speed operation on 60-cycle polyphase circuits.

The mechanical construction of these motors is compact, rugged and simple. Rigid frames and end shields, liberally designed shafts and bearings, ample air gaps and good insulation enable these motors to withstand the severe service met with by this type of motor.

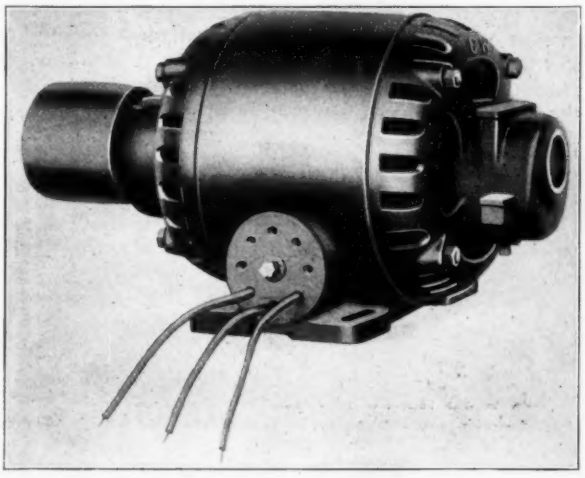
Good starting torque and high power-factor are among the electrical features of these motors, the long and successful experience of the company in designing and building motors for application to all classes of service resulting in this design of motor in which the



Squirrel-Cage Rotor of New Induction Motor.

electrical characteristics are combined in such a way as best to meet the requirements of small-motor applications.

Among the special features of these motors is their efficient ventilation. A number of the rotor bars project for a short distance at each end of the rotor core. These projecting ends of the rotor bars serve as efficient fans. Attached to the inside of each of the bearing shields is a pressed-steel guide that separates the incoming from the outgoing air. Air is thus drawn into the motor at each end through openings near the shaft and then forced by the fans against the stator winding, around the ends, and finally out through the holes near the outer periphery of the shields. This construction prevents the outgoing warm air from



Crocker-Wheeler Form P Induction Motor.

mixing with the air being drawn into the motor. A maximum cooling effect with a minimum of windage loss is thus obtained.

Strong insulation of the stator windings is obtained by placing the coils in well insulated slots and impregnating the complete core and winding with a special varnish which renders them moistureproof and enables them to withstand acid fumes. After the core and coils are removed from the impregnating tanks they are baked and again dipped in varnish and baked.

The bearings are large with oil grooves so located that no matter in what direction the belt-pull may be there will be a film of oil between the shaft and the bearing, thus reducing friction to a minimum. Dust and dirt are kept out of the bearings by sheet-metal

caps at the ends and by self-closing oil-well covers.

Slotted feet cast integral with the stator frame facilitates accurate belt-tension adjustment.

New Faries Metal Shades and Reflectors.

The line of metal shades and reflectors which the Faries Manufacturing Company, Decatur, Ill., has been marketing for many years has recently been considerably extended. New features also have been added to make these lighting accessories of more universal value, especially for industrial lighting installations. These shades are made both of steel and aluminum. The steel shades are very strong and are usually finished with green enamel on the outside and either frosted aluminum, white enamel or porcelain enamel on the inside. Most of the shades are made of a single piece. In some cases, however, a two-piece shade can be secured, which may be used with either standard or mogul-base porcelain socket and arranged so that the shade can be removed for cleaning without interfering with the wiring connections.

A feature of many of these shades is a patent collar lock holder. This is made in two pieces, one of which slips over the neck of the socket. It is split and has a groove in its lower end to fit over the bead or the screw thread provided on some sockets for attaching the holder. This piece has slanting saw-tooth slots cut on opposite sides. The other piece fastens rigidly to the shade or reflector and is provided with two prongs on opposite side, which fit into the slanting saw-tooth slots of the first piece. In attaching the device the collar is held with the left hand and the shade is turned with the right. The shade can thereby be easily tightened on the socket, regardless of variation in size of sockets. This locks the shade securely and it will not pull off until released. It does allow the shade to swivel on the socket, however. To release the shade it is necessary merely to push it up or in, as may be required, until the prongs are released by the teeth. The shade is then turned to the left, which permits it to be removed.

In the accompanying illustrations are shown a few of the various new sizes and types of metal shades. These are made in cone, deep-bowl, shallow-bowl, shallow-dome, angle and parabolic types. The views shown herewith are chiefly of the shallow-bowl type, which are used where an extensive type of light distribution is desired.

Fig. 1 shows a two-piece shallow-bowl reflector for use with porcelain socket and intended for 200 to 500-watt gas-filled tungsten lamps. It is made in 18 and 20-inch diameters and provided with the top fitting tapped for one-half-inch pipe and threaded for three-eighth-inch socket inside. This two-piece shade can be removed for cleaning without disturbing connections.

Fig. 2. shows a similar reflector of slightly smaller size, the diameter in this case being either 16 or 18 inches and the outfit intended for use with 100 or 200-watt lamps. This reflector is of one-piece type.

Figs. 3 and 4 show shallow-bowl reflectors with diameter 10¼ and 12½ inches, respectively. The first of these is for use for lamps from 25 to 75 watts and the second for 60 to 100-watt lamps. Each of these reflectors is provided with the new patent collar lock holder.

Figs. 5 and 6 show reflectors of similar shape and size, but provided with clamping holders, which are quickly clamped to the weatherproof socket by means of set screws.

Fig. 7 shows a new form of the parabola reflector suitable for 25 to 60-watt lamps. This is provided with the new patent collar lock holder, whereby a quarter turn locks the shade in place. All the reflectors shown are made both in steel or aluminum with the three inside finishes mentioned above.

Fig. 1.—Two-Piece Shallow-Bowl Reflector for 200 to 500-Watt Lamps.

Fig. 2.—One-Piece Shallow-Bowl, Reflector for 100 to 200-Watt Lamps.

Fig. 3.—Shallow-Bowl Reflector with Patent Collar Lock Holder, for 25 to 75-Watt Lamps.

Fig. 4.—Shallow-Bowl Reflector with Patent Collar Lock Holder, for 60 to 100-Watt Lamps.

Fig. 7.—Parabola Reflector with Patent Collar Lock Holder, for 25 to 60-Watt Lamps.

Fig. 5.—Shallow-Bowl Reflector with Clamping Holder, for 25 to 75-Watt Lamps.

Fig. 6.—Shallow-Bowl Reflector with Clamping Holder, for 60 to 100-Watt Lamps.

Helping the Dealer in Christmas Sales

Details of "Helps" Which the Westinghouse Electric and Manufacturing Company Is Offering to Make the 1917 Season a Banner One

HELPING electrical dealers to do the biggest 1917 Christmas business in the history of merchandising is the slogan of alert manufacturers of electrical appliances in preparing their sales promotion helps for the rapidly approaching Christmas season. Any merchant who desires to sell electrical appliances and who is willing to help himself by employing modern methods of merchandising must be able to find in a good sales plan, just the helps that he needs to put across the appeal to the people in his community.

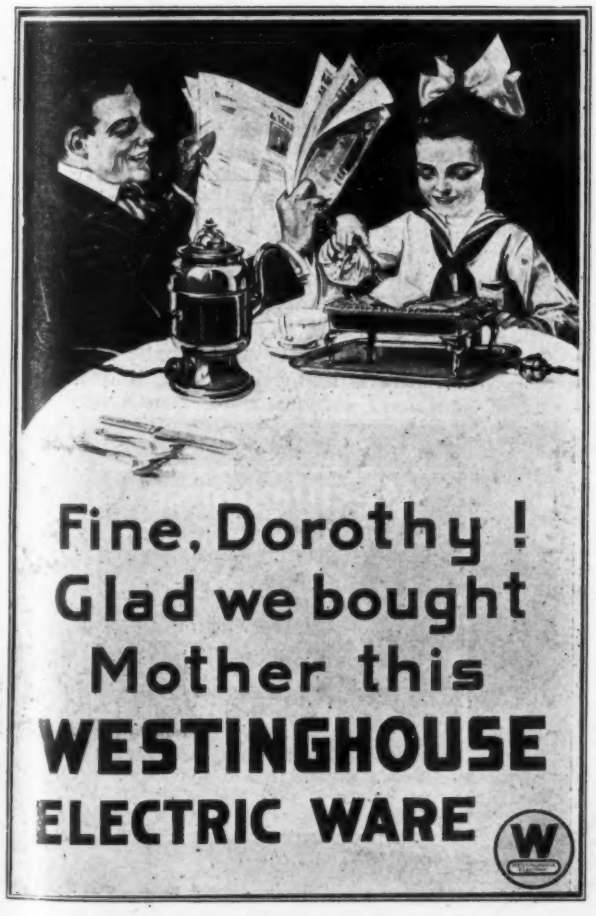
An attractive campaign book in colors illustrating the many sales helps offered by the Westinghouse Electric & Manufacturing Company has been issued. Realizing the tremendous effect of national advertising in influencing people to give useful and lasting electrical gifts, the entire sales plan has been given "back bone" in the way of a strong campaign of double-page advertisements which will appear at the right time in the leading popular magazines. In helping dealers to cash in and to sell goods to people that they serve, a series of selling helps printed in brilliant colors and employing every productive method of advertising have been provided. These include window-display material, a mailing folder, street-car cards, electrotypes for newspaper advertising, bill board posters and lantern slides.

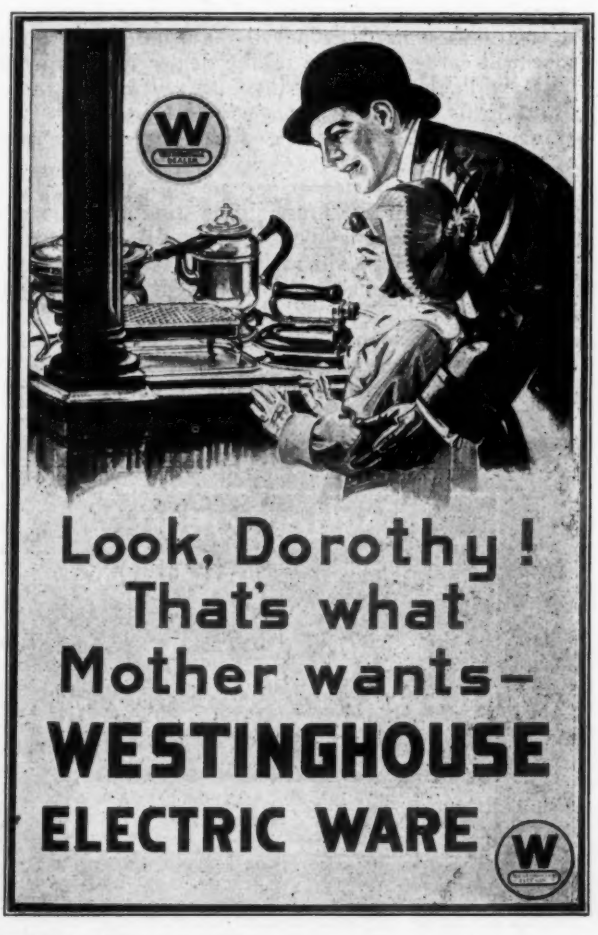
Display Windows.

In recognizing the importance of the display window to the dealer, an unusual quantity of window-display material has been provided. In addition to a cardboard cutout, a window-display stand in the center of which old Santa himself appears, and window cards reproducing Lyendecker paintings, a complete window display is offered. This display consists of eight circular pieces to be attached to the window pane near its edge, each illustrating in bright colors some appliances. A center piece shows a woman pressing a button, and a piece to go across the top of the window contains a holly border and wording suggesting electric ware for Christmas gifts. Red paper ribbons run from the center piece to the eight smaller circles.

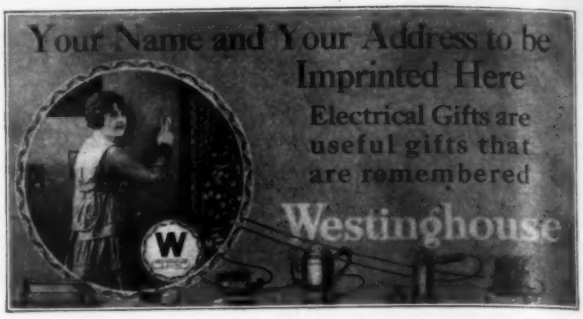
Attractive Literature.

A 24-page Christmas consumer folder is provided entitled "The Electrical Gift List," is distinctive in form and is a radical departure from standard practice in that it measures 2¼ by 2¾ inches. Its distinctive form is enhanced by the cover design printed





Samples of Advertisements to Promote Giving Electrical Appliances.



Two Typical Street-Car Cards Furnished Dealers.

in green, black and red, which produces a lighted Christmas tree—much in keeping with the spirit of the season. Each right-hand page of this little book explains the desirability of a certain appliance as a gift with two blank lines on which can be written the name of an individual to whom it might be given. There are also two pages suggesting such gifts as vacuum cleaners and washing machines—not a Westinghouse manufacture but which can be profitably sold by dealers and central stations. This small size of book was decided upon, as it is the kind of book women like to carry in their purses and shopping bags. A mailing envelope for the booklet is provided if desired.

Street-Car Cards.

Two street-car cards printed in red and green will be furnished. These cards contain "human interest" pictures and illustrations of appliances themselves. Instead of printing the name of the manufacturer at the top of these cards, which is the usual custom, this space will carry the name of the dealer in prominent letters, while the name Westinghouse will appear at the bottom to tie in with the magazine advertising. This arrangement will increase the effectiveness of the card for the dealer.

The electros of newspaper ad cuts will contain, inside a holly border, illustrations used in the magazine advertisements. Thus a forceful tie up with national advertising will make the dealer's local ads more readily recognized and give them greater attention value.

Inasmuch as many dealers find billboard advertising very profitable, two 8-sheet posters in many colors containing large holly wreaths will be supplied. Lantern slides in colors also reproducing the pictures in the national advertisements will be offered.

All of this service is furnished to dealers without charge through the regular channels of distribution of the Westinghouse Company.

In considering the fact that we are going through a commercial period when business is even better than usual, electrical dealers can profit and can determine the dollars they will make which will be based upon their own progressiveness in using the effective sales helps provided by manufacturers.

Bulletin On School of Applied Industries.—Carnegie Institute of Technology, Pittsburgh, Pa., presents, in its Bulletin on Executive Training for the Industries, an interesting outline of the courses and purposes of the School of Applied Industries in the Carnegie Institute. Training for positions of trust and responsibility is secured by a type of education that consists of a combination of industrial study with the higher education. The courses cover broad industrial fields, including machinery, building and the printing trades; others pertain to training in particular industries, training of teachers, and for those who are already engaged in the trades

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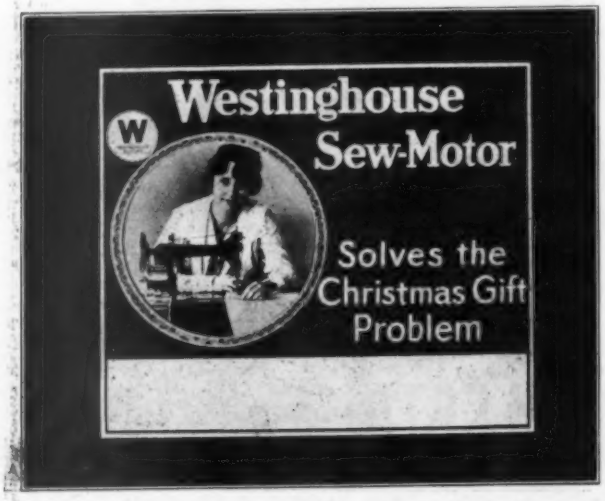
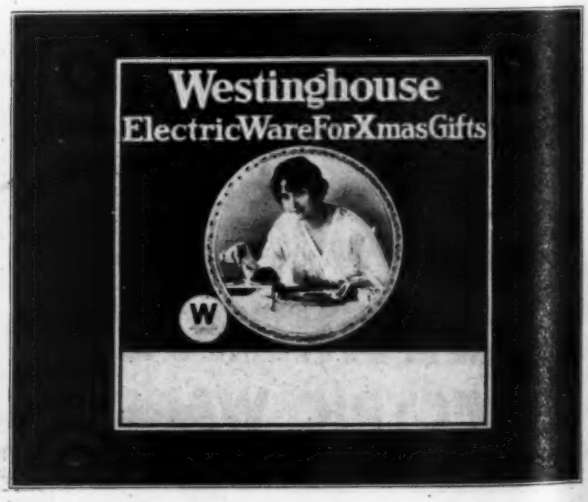
New $1,000,000 Shipbuilding Plant.—The Fore River Shipbuilding Company, a subsidiary of the Bethlehem Steel Corporation, whose activities were described in the July 7 issue of the Electrical Review, will construct an additional shipbuilding plant on its Quincy, Mass., property at a cost of approximately $1,000,000. The new plant wil be partly financed on the basis of contracts let by the United States.





Two Appropriate Lantern Slides from a Complete Series.

Activities in the Trade

J. O. **Heinz Company,** Springfield, O., manufacturing electrical apparatus, has been acquired by the Robbins & Myers Company, which will continue the business in its present plant.

Enterprise Electric Novelty Company, New York City, manufacturer of portable flashlights and batteries, has opened headquarters at 706 Sansome Street, San Francisco, Cal.

Crocker-Wheeler Company, Ampere, N. J., has issued Bulletin 182, describing its new form P induction motors. These are 2-phase and 3-phase squirrel-cage motors, made in sizes from ½ up to 3-horsepower. The details of construction of the motors are well described and illustrated.

American Well Works, Aurora, Ill., through their Chicago office, are furnishing two 30-inch, double-suction, centrifugal pumps, each of 16,000 gallons capacity, for installation in the electric pumping plant of the Savanna and York drainage and reclamation district in the vicinity of Savanna, Ill. These pumps are to work against a head of 15 feet and have a guaranteed efficiency of 78 per cent.

The **Packard Electric Company** organization, Warren, Ohio, has launched a little publication called "Packard Doings." Its mission is to create and maintain closer co-operative relations among the company's employees. Like many another recorder and reflector of those activities that make up the daily lives of employees, it stands for efficiency, initiative and the community of interest that should reach all departments.

Washing Machine Manufacturers are urged to eliminate waste, to reduce friction and speed up the output. This was the gist of a declaration by R. D. Hunt of the Dexter Company, Fairfield, Iowa, in an address before the American Washing Machine Manufacturers' Association meeting at Chicago, September 21. He asked co-operation to adopt a plan for reducing costs. The association published a booklet, "Who Washes Your Clothes?", and has requests for more than 170,000 copies of it. In this no type of machine is recommended.

Republic Flow Meters Company, Chicago and New York City, has issued Bulletin No. 5, in which its meters are illustrated by half-tone cuts. The mechanism of this meter is shown and its principles are explained. These meters are adapted to determining flow measurements of water, steam, air and gas. They both measure and register the flow of a fluid passing through a pipe. Several types of flow meters are presented. The bulletin contains a velocity chart for calculating velocities. The company's Chicago office is at 565 Washington Street.

Benjamin Electric Manufacturing Company, Chicago, Ill., has issued Catalog No. S-2, dealing with Benjamin-Starrett panelboards and cabinets. These panels are of unique construction, an illustrated description of which was given in the ELECTRICAL REVIEW AND WESTERN ELECTRICIAN of July 25, 1914. The panels are made both with and without switches of the push-button, snap or knife type. One form of these panels is of the dead-front type. The catalog also illustrates and describes these panels equipped complete with cabinets. Methods of installation are shown, including method of connecting meters, etc. Copious data are given on these products.

Westinghouse Lamp Company, New York City, has published and is distributing to owners or managers of industrial plants two valuable books dealing with industrial lighting. One of these is entitled "Increasing and Improving Production," and is written by R. T. Kent. The other book is "Successful Industrial Management," written by Harry Franklin Porter. In both these books the importance of giving careful attention to satisfactory industrial lighting is emphasized and the bearing of poor lighting on accidents, reduction in efficiency, diminution in quantity and quality of product is clearly pointed out. The cost of good lighting is shown to be almost trivial in view of the benefits which it brings. These books are deserving of careful study by any one interested in improving lighting conditions in industrial establishments.

Walter A. Zelnicker Supply Company, St. Louis, Mo., sends out bulletin 220, which contains offerings of railway equipment, for both steam and electric lines; steam shovels, power equipment, both steam and electric. Included are steel piling, pressure and storage tanks.

Central Electric Company, Chicago, issues a price list of its G. E. red core rubber-covered wires and cables, including single-conductor solid, and stranded, and solid duplex double braid. Also, prices of fixture wire of light and heavy insulations are given. Attention is called, also, to its Tungar rectifier for small battery charging, which is described and well illustrated.

The Electric Machinery Company, Minneapolis, Minn., will build an addition to its plant, 64x122 feet, to be completed in 90 days. The work will be rushed because of Government orders received for electric generators and other electric machinery and appliance for the use of shipyards working on Government contracts. A 60-foot electric crane with carrying capacity for 30 tons will be added.

Erie City Iron Works, Erie, Pa., whose trade in the Orient is assuming much importance, has sent P. R. Prescott, one of their best engineers, to Japan, with the idea of his spending a year there in the interests of the Erie City and the American Trading Company, their sales agents in the Far East. A number of installations have been made in Japan and China of the Erie City horizontal and vertical water-tube boilers and Lentz engines.

The Scott-Ullman Company, 3311-25 Perkins Avenue, Cleveland, Ohio, devotes its new Folio No. 5 to the illustration of a variety of lighting fixtures for residential lighting. In this book the design, construction and quality of material are brought out. This company has taken steps to protect its designs against those who make a practice of appropriating designs of others. These fixtures are of artistic finish and varying design to conform to tastes and purposes. Prices of all types illustrated are given in the back of the book.

The Sanford Riley Stoker Company, Ltd., Worcester, Mass., has had such an increased volume of business in the Riley underfeed stokers that it has arranged for additional manufacturing facilities in Detroit, Mich., at the plant of the Murphy Iron Works. There will be no change in the management or policy of the Murphy Iron Works. They will continue their facilities as required for the production of Riley stokers. R. Sanford Riley, Worcester, Mass., has been elected president of the Murphy Iron Works. The B. F. Sturtevant Co. of Hyde Park, Mass., will continue to manufacture and act as selling agents for the Sanford Riley Stoker Company.

Barnes-Lindsley Manufacturing Company, 503 Couch Building, Portland, Ore., makes a specialty of Douglas fir cross-arms. About half of all the wooden cross-arms used during the year 1916 were of Douglas fir, and an effort is being made to standardize the cross-arms as to sizes. Fewer sizes would reduce costs. There are now four sizes. It is suggested that the 3½ by 4½, known as the N. E. L. A. standard, be changed to 3¼ by 4¼ to conform to the Electric Light and New England standard, the latter being the size of 45 per cent of all cross arms used. Some interesting timber scenes are given in this company's folder, showing also shop pictures in which cross-arms are being made.

Coppus Engineering Company, Worcester, Mass., calls good attention to the Coppus turbo blower, types A and B, in a recently-issued bulletin. Blowers and fans generally are discussed in the light of their economy and efficiency in producing mechanical draft. The Coppus blower consists of a propeller fan driven by a steam turbine, both mounted on the same shaft. The individual blower for each boiler is advocated, and for the Coppus blower special simplicity and rigidity of construction are claimed as a surety against becoming disabled. Various plates are given, showing Coppus blowers attached to boilers to produce draft. The construction of this blower is fully described and its applications clearly shown.

A. F. Daum, Pittsburgh, Pa., manufactures the Daum refillable cartridge fuses for electric light and power. This type meets a demand for fuses in which the fuse element may be replaced and the fibre shell saved, as well as the end metal caps. The old method of discarding these was wasteful and necessitated carrying duplicate sets. A folder issued describes and illustrates the Daum type E, or blade fuse, refillable plug fuse and other forms. Directions for refilling are given, together with prices and such other information as the buyer wants.

The Esterline Company, Indianapolis, Ind., manufacturers of curve-drawing instruments, has appointed A. G. Lucas as district sales agent for the Chicago territory, with office at 1160 Monadnock Block. Mr. Lucas succeeds O. P. Smith, who resigned that position to engage in another line of business. The Esterline Company also announces the appointment of Fred H. Dorner as sales agent for the state of Wisconsin, with office at 743 Wells Building, Milwaukee. His territory also includes the upper peninsula of Michigan.

Raymond Concrete Pile Company, Harris Trust Building, Chicago, is operating a machine shop at Harvey, Ill., in which the steel cores and steam hammers used in its business are made. All the shop tools, hoists and other equipment are electrically operated, the current for this work furnished by Commonwealth Edison Company, amounting to about 3,440 kilowatt-hours per month. The Raymond company has similar shops at Youngstown, Ohio, and Bogota, N. J.

The Overland Motor Car Company, Kansas City, is having an electric sign put on the roof of its building. The sign is being erected by the Federal Sign Company, which is 96 feet long and 17 feet high. One feature of the sign is that the lower cased style of letters will be used with a double row of sockets. The Overland Motor Company has leased this sign for a period of three years at a total rental of about $6,800.

Pass & Seymour, Inc., Solvay Station, Syracuse, N. Y., manufacturer of P. & S. electrical supplies, advises that Aldo Calabi, via Conservatorio, 30, Milano, Italy, is interested in such equipment as porcelain insulators, switches, wire, large and small lamps, electric stoves, irons and fan motors. Correspondence should be in Italian. He is reported being a heavy buyer.

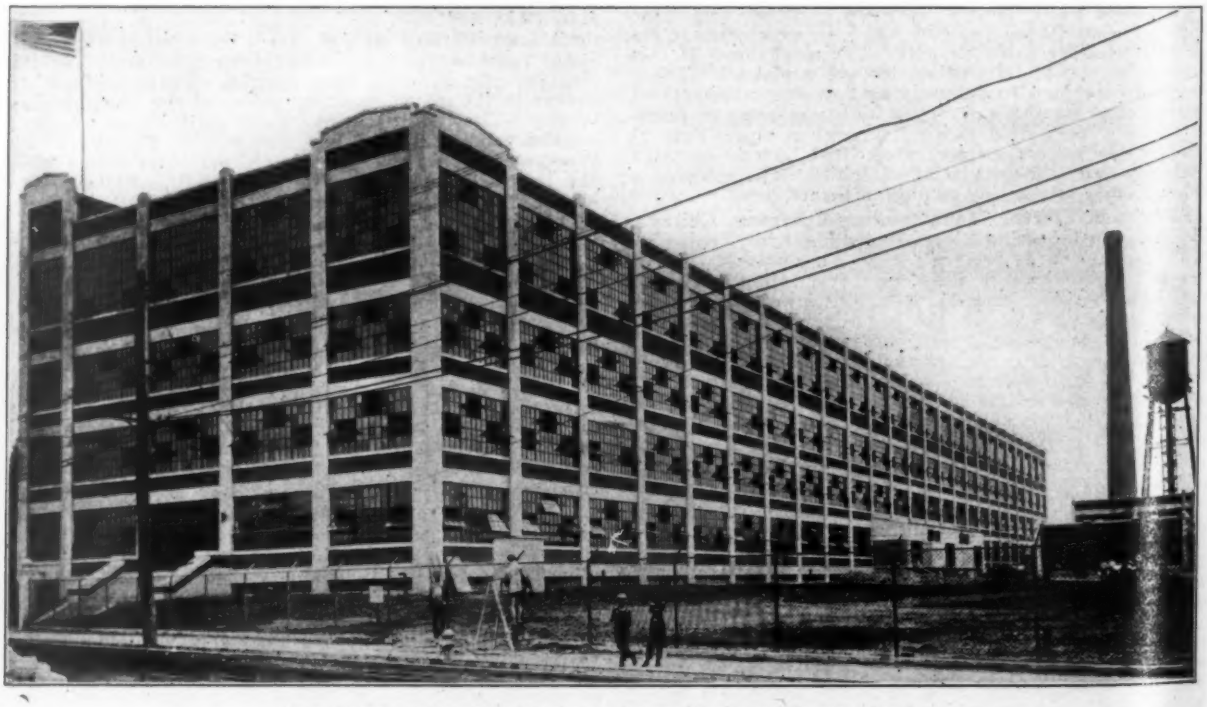
Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has leased the new five-story factory building, now in course of construction at 927-31 North Front Street, Philadelphia. The structure will cover about 60,000 square feet of floor space.

Wirt Company, Philadelphia, issues an illustrated folder of interest to dealers and users of electric light. In this are displayed the company's several styles of Dim-A-Lite attachments and fixture sockets, whereby the intensity of light is so regulated that the user may pull in any one of five changes—full light, low, dim, night light, and out. The Dim-A-Lite standard attachment for this kind of regulation screws into the ordinary socket and takes any lamp. Thus, electric light is turned up or down like gas. The same folder shows specimen advertisements in which the economy and convenience of these fixtures are played up in home scenes.

Multi Refillable Fuse Company, 703 Fulton Street, Chicago, announces the opening of a branch office at 120 Liberty Street, New York City, and the appointment of James W. Morey as eastern sales manager. The intention is to carry a liberal stock of both refillable and non-refillable fuses at the New York branch, and to render the best possible service to eastern customers. Mr. Morey is well acquainted with the electrical trade in that territory. He has been active in the electrical supply business during the last ten to twelve years.

Sprague Electric Works of General Electric Company, New York City, presents complete information and prices on Sprague panel boards and cabinets, in catalog No. 47901, which is a 66-page book of value to dealers and users. It contains general specifications, information on panel-board construction and directions for ordering. A vast amount of data are given on a number of types of double branch panels, metering panels, meter loops, and through feeds for panels, with prices.

Westinghouse Lamp Company, 165 Broadway, New York City, opened its new factory at Trenton, N. J., on September 1, which is the fourth of its Mazda factories. The new plant represents the final word in factory design and construction, calculated not only to secure the highest manufacturing efficiency, but to offer working conditions that will attract the highest-grade operatives. The Trenton works are equipped with facilities for producing 50,000 lamps per day, with an ultimate capacity of 75,000. Other lamp works of this company are situated at Bloomfield, N. J., Milwaukee, Wis., and New York City. The production of the Trenton factory, added to that of the other three named, places the company in position to meet the future demands of this line of trade, and do so in a prompt and efficient manner. The combined output of the four plants is aimed to anticipate the probable requirements of the company's customers. A view of the new factory is shown in the accompanying illustration.



New Factory of the Westinghouse Lamp Works at Trenton, N. J.

Personal and Biographical

CHARLES R. BERRY, manager of the Carbondale (Pa.) works of the Scranton Electric Company, Scranton, Pa., has been transferred to the Pittsburgh district, effective October 1.

L. W. DICKSON is now assistant business manager for the Empire District Electric Company, Joplin, Mo. Mr. Dickson formerly was connected with the Denver Gas & Electric Light Company.

LEON C. HERRMANN, secretary of the Badt-Westburg Electric Company, Chicago, was married September 5, 1917, to Miss Florence G. Williams, daughter of Mr. and Mrs. Richard Williams, Chicago.

E. V. PRYOR has accepted a position as business manager for the Jefferson City Light, Heat & Power Company, Jefferson City, Mo. He was previously connected with the Illinois Traction Company.

PHILIP K. CONDIT, formerly export manager of Western Electric Company, is now assistant director of the Bureau of Export Licenses, and is in charge of the bureau's New York City office, at 11 Broadway.

L. J. LEMEN is now business manager of the Massillon Electric & Gas Company, Massillon, O. Mr. Lemen formerly was connected with the Montgomery Light & Water Power Company and the Toledo Railways & Light Company.

C. C. DE BRULER has become manager of electric range sales for the Colorado Power Company, Montrose, Colo. Prior to his new connection Mr. De Bruler was a member of the electric range sales force of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

F. A. VAUGHN, consulting engineer, gave an illustrated lecture on street lighting before the recent meeting at Racine, Wis., of the Wisconsin League of Municipalities. Mr. Vaughn is senior member of the firm Vaughn & Meyer, Milwaukee, and is consulting engineer on street lighting of the city of Milwaukee.

ALFRED E. WALLER, production manager of the Ward Leonard Electric Company, Mount Vernon, N. Y., and Miss Berthé MacMonnies were married on September 19, at Bronxville, N. Y., and left immediately thereafter on an automobile camping trip through the Adirondacks. Mr. and Mrs. Waller will make their residence in New York City.

JOHN H. BAKER, well known to the electrical trade as salesman and specialist in electric power applications, has opened an office at 95 Liberty Street, New York City, to enter business for himself as manufacturers' representative, to specialize in electrical equipment of factories, and such side lines as cranes and industrial trucks. Mr. Baker was connected with the Diehl Manufacturing Company, Elizabeth, N. J., for eight years, the last two years of which being in the position of sales manager.

THOMAS F. KELLY, commercial manager for the Dayton Power & Light Company, Dayton, O., recently was elected director of the Greater Dayton Association, which is made up of industrial, commercial and civic divisions. Mr. Kelly is one of three representatives of the commercial division.

A. G. DE CLERCQ was chosen president of the Commonwealth Edison section of the National Electric Light Association, at the annual election held in Edison Building, Chicago, September 25. Mr. de Clercq, who holds the position of assistant construction superintendent in the Commonwealth Edison organization, is 37 years of age, is a native of Dwight, Ill., and has been with that

A. G. de Clercq.

company 18 years. He acquired an education by hard application under unfavorable opportunities. Part of his school training was obtained at the Michigan Agricultural College and in Lewis Institute night course, Chicago. He went to Cuba in 1898 as a soldier in the First Illinois Infantry volunteer regiment. He got his first position with the Commonwealth Edison Company, in 1899, as a helper in the testing laboratory, while studying engineering at Lewis Institute. This led to a subordinate position in the construction department, where he advanced successively to positions of job foreman, assistant and district foreman, superintendent of station construction, and finally to that of assistant superintendent of construction.

L. H. PALMER has resigned as general manager of the Eastern Pennsylvania Railway System, Pottsville, Pa., to accept the position of assistant to the president of the United Railways & Electric Company, Baltimore, Md. The change took effect October 1. As Mr. Palmer's successor has not yet been appointed he will continue to act for the present as general manager of the Eastern Pennsylvania. He had been in Baltimore ten months before going to the latter company in April, 1916. Mr. Palmer formerly was superintendent of transportation for the New York Railways Company. While general manager of Eastern Pennsylvania Railway System he was identified with the J. G. White Management Corporation.

COLIN G. FINK recently withdrew from the General Electric Company, after more than ten years' service therewith, to accept the post of managing director of the Chile Exploration Company's research laboratories, New York City.

M. G. LLOYD, associate electrical engineer, Bureau of Standards, Washington, D. C., during a recent trip to the West made an address before the Iowa League of Municipalities on the subject "Better Standards for Public Utility Service." He also addressed the students of the University of Iowa at Iowa City. Dr. Lloyd was for many years technical editor of the ELECTRICAL REVIEW AND WESTERN ELECTRICIAN and is now devoting himself to public utility work of the Bureau of Standards. One of the most important problems now under consideration is the question of revision of standards for gas service, especially in changing from the candlepower to the heat-unit base. Street lighting is also a subject that is being given much attention and both these matters were given special study during Dr. Lloyd's trip.

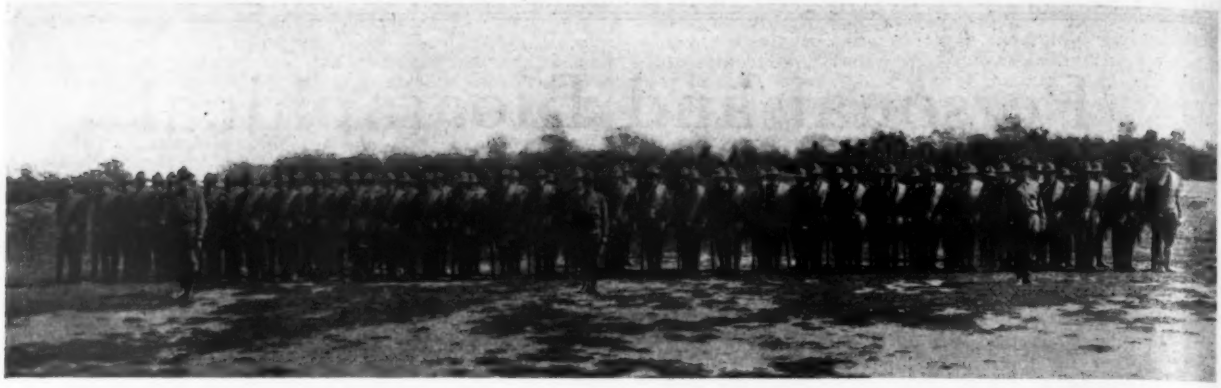
Obituary.

ROYAL CANFIELD PEABODY, president of the Combustion Engineering Corporation, New York City, died September 15, 1917.

GEORGE LUCIUS FOOTE, formerly a member of the firm of Foote, Pierson & Company, 160 Duane Street, New York, died at his home at 107 Macon Street, Brooklyn, September 26, aged 74 years. Mr. Foote had been engaged in the manufacture of electrical goods for many years, but retired from business some years before his decease.

MORRIS H. GREF, 39 Cornelia Street, Brooklyn, N. Y., died September 22 at the age of 60 years. Mr. Gref was a pioneer lineman, and laid the first telephone wires between New York and the old city of Brooklyn. At the organization of the Postal Telegraph & Cable Company, Mr. Gref became associated with the company, changing the system from battery to dynamo.

JOHN L. FULLER, manager of the North American Telegraph Company for the last 30 years, died September 23 at 4329 Robinson Street, Duluth, Minn. He had been ill for a month and hardening of the arteries was given as the cause of his death. He leaves a widow, and one brother, E. S. Fuller, of Woodworth, Okla. Mr. Fuller was born in Friendship, N. Y., October 5, 1847, and went to Duluth in 1887, to open the office there for the telegraph company. He was a member of the Elks Lodge for the 30 years of his residence in Duluth, having held the office of exalted ruler for a year and was secretary of the lodge for several years.



Company "E," Eleventh Infantry, Illinois National Guard, Composed Entirely of Commonwealth Edison Employes.

Men in Government Service

Items of Interest Concerning Power and Electrical Men Who Have Joined the Colors

LEE W. THOMPSON, employed as electrician at an industrial plant at Frankfort, Ind., has joined the National Army.

CENTRAL ELECTRIC COMPANY'S employees, Chicago, have promptly responded to the nation's call to military and naval service. There are now 24 of these young men in different branches of national defense. The list is made up as follows: Alexander McKinlock and Robert C. Sturgis, First Officers' Training Camp, Ft. Sheridan; Charles Edward Brown, Jr., in Aviation Corps; C. B. Nelson, in Second Officers' Training Camp, Ft. Sheridan; John Heyl, sergeant in First Illinois Infantry; others in various branches are: J. W. Nelson, Leon Rote, H. Privat, Harry Lavinne, Henry Wagner, Alfred Kolkan, Fred Kolle, J. Mosier, Peter Thomson, James O'Neal, Henry Carroll, Arthur Smith, H. Heseltine, T. Hubert, Emil Holzer, Charles M. Bigelow, Walter Eckert, George Hillock, Ed Gerald. Central Electric Company has been prompt and wholehearted in co-operating with the Government, in supporting every proposal to help meet the demands of a gigantic war. Its officers have taken a stand, not of passive loyalty, but aggressive support of the Government.

FRED F. VALINOTI, superintendent of construction of the Harry I. Wood Company, Louisville, Ky., for a number of years, has gone to Ft. Leavenworth, Kans., where he will enter training as a lieutenant of engineers. He some time ago received the commission in the Officers' Reserve Corps and was ordered to report for duty September 28. A farewell luncheon at the Henry Watterson Hotel was given in his honor by the Louisville Jovian League, at which several complimentary addresses were made and a profusion of wrist watches presented to the departing lieutenant. The first was a present by Mr. Wood, who arranged for a clever hoax in the guise of a United States marshal who "arrested" Mr. Valinoti and handcuffed his hands behind him. While he was thus helpless Mr. Woods strapped one of the watches Val had declared he would never wear, to his wrist. Then F. V. Gantt, president of the League, in a neat speech, presented a second wrist watch in behalf of the League. He was followed by C. C. Childers, who on behalf of the Electrical Clearing House attached a third timepiece to Mr. Valinoti's wrist. This was a big alarm clock, to which a steel band had been securely attached and arranged to fasten with a massive padlock. This Mr. Childers snapped shut and ostentatiously threw the key to the lock out of the window. Finally James Clark, Jr., concluded the presentations by delivering the well-liked member a handsome officers' emblem with the best wishes of the Clearing House men.

ROLL OF HONOR.

The electrical industry, perhaps to a greater extent than any other industry, has answered the call of the Nation for men. As this is a war of engineers, naturally the technically trained men in the electrical industry have been in great demand and they have responded with splendid patriotism. Many of the large utility and industrial corporations have assigned men for Government service aside from those who have voluntarily entered or been called for service.

THE ELECTRICAL REVIEW will *welcome news concerning men who have entered the service or who are engaged in any patriotic duties.*

Fred F. Valinoti.

R. A. WHITFORD, an electrical engineer of La Fayette, Ind., has entered the engineers' training camp, of the Officers' Reserve Corps.

BENJAMIN C. PERKINS, secretary of the Arrow Electric Company, Hartford, Conn., and Roy D. Heymann, purchasing agent of the same concern, both enlisted, August 25, in the 101st Machine Gun Battalion, U. S. A.

PUGET SOUND TRACTION, LIGHT & POWER COMPANY'S employees, to the number of 85, have entered the service of the United States in the Army and Navy, or have been accepted and certified under the draft. They include men from all departments of the company's service.

THE ASSOCIATED EMPLOYEES of the New Orleans Railway & Light Company issue a monthly publication called "Energy," in which the activities, ideals and originalities of the entire force are presented. The fact that many of the men on the staff of this company have responded to the nation's call is noted. Among the recent volunteers are A. E. Maurin, in hospital service; David Lawler and Howard Lewis are at Great Lakes Naval Training Camp.

Current Electrical News

WEEKLY RECORD OF CONSTRUCTION ACTIVITIES

EASTERN STATES.

BOSTON, MASS.—Crosby Steam Gauge & Valve Company, 38 Central street, has had plans prepared for the erection of a new one-story powerhouse addition to its plant, about 25x40 feet.

QUINCY, MASS.—The Fore River Shipbuilding company, a subsidiary of the Bethlehem Steel Corporation, will construct an additional shipbuilding plant on its Quincy property at a cost of approximately $1,000,000. The new plant will be partly financed by the United States Government and will be used to build destroyers for the navy.

BRIDGEPORT, CONN.—A. and E. Henkels, Connecticut avenue, have filed plans for the construction of a new one-story powerhouse, about 47x82 feet, for works operation. Contract awarded.

BINGHAMTON, N. Y.—Binghamton Light, Heat & Power Company has secured a contract from the Hires Condensing Company, Philadelphia, for furnishing power to its proposed new plant just north of the city. The works will require about 250 horsepower.

BROOKLYN, N. Y.—United States Government, Bureau of Yards & Docks, is having plans prepared for the construction of a new power plant at the naval hospital, Brooklyn Navy Yard. F. R. Harris is chief.

BUFFALO, N. Y.—International Railway Company, Ell Square, has filed plans for the construction of a new substation, to be erected at 285 Military Road. The structure is estimated to cost about $7000.

FULTON, N. Y.—Volney Paper Company has had plans prepared for the construction of a one-story and basement powerhouse, about 35x50 feet. Sackett & Park, 34 Syracuse Savings Bank Building, Syracuse, are the architects.

ITHACA, N. Y.—Cayuga Power Corporation is planning for the construction of an addition to its power plant at Portland Point to cost about $15,000.

LOCKPORT, N. Y.—United Paper Board Company, 171 Madison Avenue, New York, has awarded a contract for the construction of a new one-story powerhouse, about 35x100 feet, to be erected at its local plant. Curran & Swartout, 440 Granite Building, Rochester, are the contractors.

MANLIUS, N. Y.—Town Council has completed the installation of its new electric street lighting system.

SAG HARBOR, N. Y.—Sag Harbor Electric Light Company has acquired the property of Henry P. Williamson on Bridge street, and is reported to be planning for extensions.

SYRACUSE, N. Y.—City is planning the construction of a municipal electric-lighting plant. At the present time the Syracuse Lighting Company is furnishing service for this purpose.

UTICA, N. Y.—Mutual Box Board Company, 1532 Erie street, has awarded a contract to the John F. Hughes Construction Company, 200 Post street, Utica, for the construction of a new one-story powerhouse addition, about 25x55 feet.

COLLINGSWOOD, N. J.—South Jersey Radio Association has completed the installation of new wireless telegraphy equipment in the chemical laboratory of the high school. The Association is maintaining this class for the education of students desirous of entering into the Government service in the capacity of wireless operators, etc.

DOVER, N. J.—New Jersey Power & Light Company has completed the construction of about 1½ miles of its new 11,000-volt transmission line which will connect with the 1500-horsepower motors at one of the iron ore mines of the Wharton Steel Company.

LIVINGSTON, N. J.—Owing to the shortage of labor and general unsettled conditions, it has become necessary to postpone the installation of the new electric street lighting system, preliminary plans for which have already been prepared and contract awarded to the Public Service Electric Company, Newark.

NEWARK, N. J.—Public Service Electric Company is planning for the immediate installation of new stoker equipment at its Point-no-Point plant, to cost about $50,000.

PERTH AMBOY, N. J.—Board of Aldermen has awarded a contract to the Watson Flagg Engineering Company, 120 Liberty street, New York, for the installation of a new underground commercial lighting system, at $32,545. The Board is also planning the installation of a new transformer and generator to provide for increased capacity.

PERTH AMBOY, N. J.—Lehigh Valley Railroad Company, 143 Liberty street, New York, has awarded a contract for the construction of a new one-story brick and steel powerhouse addition to its local plant, about 50x120 feet, to George W. Rogers & Company, 29 Broadway, New York. Eben B. Thomas is president.

PLAINFIELD, N. J.—Niles-Bement-Pond Company, 111 Broadway, New York, has awarded a contract for the construction of a new one-story reinforced concrete and brick powerhouse, about 90x108 feet, at its local plant, to H. E. Baton, 1713 Sansom street, Philadelphia, at about $100,000. Harris & Richards, Drexel Building, Philadelphia, are the architects.

TRENTON, N. J.—Delion Tire & Rubber Company has had plans prepared for the construction of a new two-story brick powerhouse addition to its plant, about 30x45 feet. J. O. Hunt, 114 North Montgomery street, Trenton, is the architect.

GROVE CITY, PA.—Grove City Creamery Company will build a new power plant addition to its works. K. E. Parks, Thirteenth and B streets, S. W., Washington, D. C., is engineer.

MARIETTA, PA.—Pennsylvania Railroad Company is planning the immediate installation of a large electric crane and kindred equipment for the handling of freight at the local yards.

PHILADELPHIA, PA.—Pennsylvania Railroad Company, Broad Street Station, have completed plans for the construction of a new one-story brick powerhouse addition to its West Philadelphia shops, about 25x50 feet, to cost about $7000.

PHILADELPHIA, PA.—F. A. Poth & Sons, Inc., Thirty-first and Jefferson streets, have had plans prepared for the erection of a new one-story powerhouse, about 44x50 feet, to cost about $75,000. Charles Casper, 925 Chestnut street, Philadelphia, is the architect. E. J. Poth is president.

PHILADELPHIA, PA.—Penn Chemical Works, 1332 Washington avenue, have awarded a contract for the construction of a new one-story brick power house and engine room, about 46x48 feet, and 18x43 feet to cost about $25,000.

PINE GROVE, PA.—Public Service Commission has dismissed the complaint of the Pine Grove Electric Light, Heat & Power Company against the Eastern Pennsylvania Light, Heat & Power Company, Pottsville, the Pine Grove company holding that the Eastern Pennsylvania company had encroached upon its territory in defiance of an agreement. The Commission held that there was no evidence of an agreement between the two companies.

READING, PA.—Metropolitan Edison Company is planning for the installation of new soot blowers in its battery of nineteen boilers at a cost of about $8,000. These blowers increase the capacity of the boilers, and also conserve fuel.

SCRANTON, PA.—Maccar Truck Company is having plans prepared for the construction of a new one-story brick, steel and reinforced concrete power house, about 32x42 feet. Duckworth Brothers, Coal Exchange Building, Scranton, are the architects.

WILMINGTON, DEL.—Diamond State Telephone Company is planning for the installation of underground conduits in Front, King, Thirty-first, Thirty-third and Thirty-sixth streets and Washington, Market and Maryland avenues. The company has received permission from the Street and Sewer Department for the opening of these beds.

BALTIMORE, MD.—Bethlehem Steel Company is planning for extensive improvements in its substation at the Sparrows Point (Md.) works.

DANVILLE, VA.—Dan River & Riverside Cotton Mills are planning for the installation of electric lights in the dwellings of its employes in the village.

NEWPORT NEWS, VA. — Newport News & Hampton Railway Gas Electric Company has increased its capital from $2,375,000 to $4,000,000 to provide for extensions and improvements.

LAKE VIEW, N. C.—Electric Light & Power Company has filed notice of increase in capitalization from $25,000 to $75,000 for expansion.

ATLANTA, GA.—Georgia Railway &

Business is Good

Regarding the possible outlook for future business, we consider that there will be more business a year from now than there is at the present time. The only trouble will be in procuring labor and raw material.—F. L. Vanderpoel, Trumbull-Vanderpoel Electric Manufacturing Company.

Power Company has awarded a contract for the construction of a new substation near its Ashby carhouse to W. H. George, Atlanta. The company now has in course of construction a new substation near Buckhead for the furnishing of power to the Camp Gordon extension.

AUGUSTA, GA.—Augusta-Aiken Railway & Electric Corporation will build a new power line through Druid Park avenue to connect its Summerville and Monte Sano lines.

SAVANNAH, GA.—Savannah Electric Company will extend an electric line to industrial center at Port Wentworth.

SOPERTON, GA.—An election will be held October 24 to decide the question of issuing $10,000 municipal bonds for the installation of an electric lighting plant.

JACKSONVILLE, FLA.—Construction of the electric railway lines between Jacksonville and resorts on seacoast is contemplated by Jacksonville & Seaboard Electric Association, of which M. J. Jennings is president and St. Elmo W. Acosta, secretary.

LAKE WORTH, FLA.—City Commission is planning for extensions and improvements in its electric lighting system to cost about $10,000.

TAMPA, FLA.—Tampa Electric Company will extend its Hyde Park-Michigan line. It is proposed to have cars in operation January 1, 1918.

NORTH CENTRAL STATES.

COLUMBUS, O.—Contract for the erection of a power plant on the Ohio State University Campus has been awarded to E. H. Latham, of Columbus, at his bid of $85,000. Architect J. N. Bradford who prepared the plans, states the entire building when completed will cost about $200,000. A chemistry building to be erected on the Campus will also cost $200,000.

SANDUSKY, O.—Sandusky Gas & Electric Company has completed the installation of its new switchboard panels for street-light control. The company has secured a contract from the Hord Color Products Company for furnishing service to the extent of 60 horsepower on a 24-hour day load.

MT. VERNON, IND.—Mt. Vernon Electric Light & Power Company has increased its capital from $5000 to $100,000.

MUSKEGON, MICH.—Council passed an ordinance recently giving a 30-year franchise to the Muskegon Traction & Lighting Company for the operation of its street car system.

PINCONNING, MICH. — Pinconning Mutual Telephone Company has increased its capital from $1000 to $2500.

ASHLAND, WIS.—Ashland Light, Power & Street Railway Company has begun the construction of a $100,000 power plant at the mouth of the Montreal River on the boundary line between Michigan and Wisconsin. A 1200-horsepower plant will be built and connected with the company's lines connecting Ashland, Ironwood and Mellen. A line will be built directly from Montreal River to Ashland across the Bad River reservation at a cost of $50,000.

MILWAUKEE, WIS.—At the quarterly meeting of directors of the Wisconsin Telephone Company expenditures amounting to $97,500 for additions and repairs to the plant in Milwaukee, and expenditures amounting to $105,800, covering similar work on plant outside of Milwaukee, were approved.

STEVENS POINT, WIS.—A dam to cost $500,000 will be built across the Wisconsin River by the Jackson Milling Company. The dam will contain 16 26-foot gates, besides a 300-foot spillway. It is expected the building of the dam, powerhouse and installing of machinery, so that electric power may be transmitted, will be completed by September, 1918.

WAUPUN, WIS.—A new lighting system to cost $4000 is to be installed in the state prison.

ST. CLOUD, MINN.—Light & Power Company of St. Cloud has been granted franchise for an electric lighting, heating and power plant.

WADENA, MINN.—City contemplates the improvement of the street lighting system; also building for distributing domestic service around the city. Address Herman Ehrke, Superintendent.

DUNBAR, IA.—A bond issue of $7000 for an electric lighting system carried at election.

DATES AHEAD.

National Electrical Contractors' Association of the United States. Annual convention, New Orleans, La., October 10 to 13. Secretary, H. C. Brown, Utica, N. Y.

The Jovian Order. Annual convertion, Hotel McAlpin, New York City, October 22-25. Mercury, Eli C. Bennett, Syndicate Trust Building, St. Louis, Mo.

Electrical Committee, National Fire Protection Association. Adjourned annual meeting, New York City, October 23-24. Secretary, Ralph Sweetland, 141 Milk Street, Boston, Mass.

National Electric Light Association, Southeastern Section. Annual convention, Birmingham, Ala., October 24 to 26. Secretary, T. W. Peters, Columbus, Ga.

BETHANY, MO.—An oil engine will be installed at the electric lighting plant, for which $4500 in bonds have been voted.

FREDERICKTOWN, MO.—The offer of $16,000 by the Missouri Public Utilities Company for the municipal lighting plant was put up to the voters of Fredericktown recently. Election will be held in about two weeks.

HARRISONVILLE, MO.—L. K. Green & Sons, who own the electric lighting plant here, are building a central plant at Pleasant Hill.

HIGGINSVILLE, MO.—Installation of a white way on Russell street, extending from the C. & A. Depot to the Mollenkamp Implement house, is being considered.

KANSAS CITY, MO.—Kansas City Light & Power Company has announced the purchase of 25 acres of land in the East Bottoms for the erection of a new power plant. It will be located at Scott street, Euclid avenue and the river and will be finished not later than November, 1918. It will represent an investment of $4,000,000.

MOUND CITY, MO.—Mound City Light & Ice Company was given a franchise on Sept. 14 to supply the city with water, having abandoned its own municipal system. Oregon, Mo., is considering a similar move with reference to its lighting plant.

NETTLETON, MO.—City is to have electric lights and the power will be supplied by the Hamilton Light & Power Company, which already has a transmission line through Nettleton to Breckenridge.

VERSAILLES, MO.—City lighting plant was destroyed by fire recently, causing considerable damage.

CANEY, KANS.—Movement is on foot to have a city owned electric lighting plant.

COLUMBUS, KANS.—Home Telephone Company is planning immediate improvements to cost $10,000. The company will put in three more circuits from Columbus to Baxter for the purpose of giving better service via Baxter into the Picher mining district. Three more circuits will be put in between Baxter and Galena. Four lines will be run between Galena and Joplin.

CONCORDIA, KANS.—Concordia Electric Light Company is making an effort to have Beloit abandon its present lighting system and connect with the Concordia concern.

CUBA, KANS.—Cuba is considering the electric light proposition, which has been submitted by the Concordia Electric Light Company.

EL DORADO, KANS.—Active work on installation of new telephone system will start soon. The new system will have 270 distributing points as compared with 19 used in the present system.

FUNSTON, KANS.—Installation of a white way for the soldiers is contemplated.

HOPE, KANS.—Ordinance has been passed for the purpose of supplying the city and its residents with electric light, heat and power.

HUNTER, KANS.—An electric lighting system is to be installed here to give 24-hour service.

HUTCHINSON, KANS.—Residents residing in extreme eastern section of city have petitioned for extension of electric lighting system.

INDEPENDENCE, KANS.—A white way for the main business blocks is now assured. It will consist of four ornamental poles on each side of the street, each bearing a single 100 candlepower lamp.

MARQUETTE, KANS.—Central Kansas Power Company is preparing a proposition for Marquette with a view to taking over the present plant and furnishing Marquette current from the power site at Abilene.

McPHERSON, KANS. — McPherson lighting plant is installing new machinery to double its capacity and will furnish current for the farmers northeast and to New Gottland. Lines will be built as soon as possible. Galva is already considering getting current here.

MILTONVALE, KANS.—Arrangements have about been completed for the sale of the electric lighting plant here to the company at Abilene. Work of putting in transmission lines will be started shortly.

PITTSBURG, KANS.—Municipal plant for power and light is proposed. Under the present system the local light, heat and power company buys its gas from the Kansas Natural Gas Company, but it is stated there is no reason why the city could not buy its supply from an independent well.

PLAINVILLE, KANS.—United Telephone Company has acquired a site and will erect an office building and manager's residence this fall or next spring.

TOPEKA, KANS.—Southwestern Bell Company Oct. 1 established division headquarters for Kansas at Topeka. It is stated the company is planning extensive enlargements of its interests here.

WINFIELD, KANS.—A right-of-way for an interurban line from Augusta is being purchased now. J. W. Hiatt, a local man, is interested in the line.

FAIRBURY, NEB.—Efforts of residents to have new bridge across the Blue at the southwest corner of town, lighted with electricity, have been successful. At a meeting it was voted to have electric line of city extended to the limits of city at west end of Second street and furnish electricity to light the bridge.

ORD, NEB.—Election to vote bonds in the sum of $30,000 for electric lights carried.

RED CLOUD, NEB.—C. G. Bennett of Hastings, a special agent for the Lincoln Telephone & Telegraph company has been looking into the prospect of purchasing the plant of the Farmers' Independent Telephone Company and uniting the two systems into one exchange. The company is going to rebuild its system in the near future. An option has been secured on the upper floor of the new Kaley building now in process of erection, and the installation of the "common battery" system is being considered. The Lincoln company is also contemplating the construction of two toll lines running thru to Saline, Kans.

SOUTH CENTRAL STATES.

HARTFORD, KY.—Kentucky Light & Power Company has announced an increase of 25 per cent in lighting rates, explained by the increase in the cost of coal and all materials and supplies.

HAZARD, KY.—Kentucky River Power Company is planning for the construction of new transmission lines for the furnishing of power to coal companies operating in the Whitesburg district, Letcher County.

MURRAY, KY.—City has issued $20,000 in bonds for an electric lighting and power plant and waterworks.

JEFFERSON CITY, TENN. — Mr. Goughnour of Newport, Tenn., purchased local electric plant. Improvements are contemplated.

NASHVILLE, TENN.—City Commissioners are planning a bond issue of $25,000 for the installation of a new police alarm system and other improvements.

ANNISTON, ALA. — Alabama Power Company, of Birmingham, is considering constructing an electric railway between Camp McClellan and Anniston.

TROY, ALA.—City is planning for the installation of a new "white way" street lighting system.

JONESVILLE, MISS.—Boyd & Alexander Company are interested in plans being made for the installation of an electric lighting system.

ASHDOWN, ARK.—M. B. Morgan, of Little Rock, has bought the Ashdown Ice, Light & Power Company from

L. M. Warmack, for $35,000. Hamilton Alexander, of Ashdown, has been appointed superintendent of the plant, which will be remodeled and enlarged.

FT. SMITH, ARK.—The first building ever erected in this city on piling is the extension of the power house of Fort Smith Light & Traction Co., on North C street. The piles extend to bed rock and support the walls and the foundation for the different pieces of machinery that will be installed. The machinery that will be installed in the new boiler and engine room will have a generating capacity equal to that of the entire plant as now constructed.

LAKE CHARLES, LA.—The installation of the largest item of preparation of the Lake Charles aviation field for the reception of the federal government, will begin at an early date. This will be the construction of the electric light and power equipment, which will cost about $100,000.

ADA, OKLA.—Interstate Construction Company is building a $1,000,000 power plant five miles north of here, which will furnish electric power for Francis, Konawa, Maud and Shawnee and manufacturing plants at Ada, Roff and probably other cities. While only $1,000,000 will be spent at present, the Mainland Bros., owners, with headquarters at Oshkosh, Wis., plan to spend several times that amount within a short time. Lines for transmissions are being erected.

CYRIL, OKLA.—A system of waterworks is being contemplated for the near future; also a light plant supplied by natural gas from one of the nearby wells.

DRUMRIGHT, OKLA.—At a meeting of business men steps were taken for the construction of a white way here to cost $10,000 and to extend along the entire street district which is to be paved.

LAWTON, OKLA.—J. Elmer Thomas, state senator and owner of Medicine Park, plans the expenditure of thousands of dollars. One of the improvements planned for Medicine Park is an electric lighting plant.

MIAMI, OKLA.—October 17 a bond election will be held for city improvements, in the electric lighting plant, the drilling of more wells, etc., to cost $200,000. The sale of the bonds already are contracted for in the event they carry.

VINITA, OKLA.—Southwestern Power Company is planning a $2,000,000 power plant, which would supply Vinita and neighboring cities with electric current. The plans are to erect a string of three dams across Grand River, similar to those at Lowell, Kans., where such a power plant is located. Charles H. Collins, First National Bank, is interested.

BEEVILLE, TEX.—City commission has awarded contract to John S. Fenner to construct a municipal electric lighting plant here.

BELLS, TEXAS.—Texas Power & Light Co., Dallas, is contemplating the construction of a substation and high tension transmission system from Bells to Whitewright.

GALVESTON, TEX.—The total costs of installing a telephone line to the causeway liftbridge is estimated at approximately $1000 by L. M. Kelsey, local manager of the Southwestern Telegraph & Telephone Company.

HEREFORD, TEX.—Movement is on foot for organization and installation of one of the finest and most up-to-date telephone systems in Texas. Ample capital will be provided and all wires placed in conduits under the ground.

HEREFORD, TEX.—Under the present franchise granted the electric light company several years ago, the city reserved the right to buy the plant under certain conditions. There is an agitation now among some of the citizens for the city to take over the plant and enlarge same so that cheaper lights and power can be supplied. Many five to forty acre tracts of land near town would be placed under irrigation if cheap electrical power could be had. Another advantage would be obtained in properly and cheaply lighting up the business and residential portions of the city.

HOUSTON, TEX.—Actual work of construction on the Government aviation camp on the Knox tract of land near Genoa began September 21. To secure the camp for Houston the Chamber of Commerce was required to furnish bond for $104,000 as a guarantee that the following conditions would be fulfilled: furnishing of electrical power at a price ranging from 10 cents to 1 cent per kilowell at $3.75 a foot, minimum cost $2100, watt hour; digging of a six-inch artesian with output of 100,000 gallons a day. Telephone and telegraph lines to be built into site without cost to Government.

MARFA, TEX.—Morrison & McCall of St. Louis, Mo., purchased Marfa Light & Ice Company's plant. Additional machinery will be installed and capacity increased.

SAN ANGELO, TEX.—Texas Electric & Power Company will complete the construction of its electric street railway system as soon as the necessary steel and other materials arrive.

SAN ANTONIO, TEX.—Council will make a new contract for street lighting with the San Antonio Public Service Company.

WESTERN STATES.

ANACONDA, MONT.—Mountain States Telephone & Telegraph Company contemplates the improving of the lighting system. Cost estimated at $35,000.

BUTTE, MONT.—A lighting system will be installed in Montana street.

AJO, ARIZ.—Southern Sierras Power Company will construct an electric power transmission line from Yuma to the mines of the New Cornelia Copper Company here, a distance of 160 miles. The contract calls for the delivery of 2000 kilowatts of electrical energy to the company. The Sierras company recently completed the construction of its power transmission line from El Centro, Cal., to Yuma, Ariz.

MONTICELLO, UTAH.—Blue Mountain Irrigation Company plans to issue $60,000 in bonds to improve the light and water plant.

HAILEY, IDA.—Vote will soon be taken on issuing $90,000 in bonds for constructing 450-horsepower light and power plant. Civil Engineer Joseph Vernon made the estimates.

ARLINGTON, WASH. — Washington Coast Utilities Company will rebuild its steam power plant, same to have a concrete foundation, superstructure to be of wood covered with galvanized iron.

OROVILLE, WASH.—Okanogan Valley Power Company has petitioned the council for a franchise to erect and maintain power and light transmission lines over certain alleys and public places.

SEATTLE, WASH.—Bids are to be called for again in a few days for construction of the proposed $3,000,000 power plant, which the city will purchase either as a complete hydroelectric plant or one which will be constructed by owners.

SEATTLE, WASH.—Bids have been opened in the city comptroller's office on $390,000 of light bonds for the extension of the Cedar River system.

SEATTLE, WASH.—Board of Public Works is asking for bids on a complete hydroelectric power plant as per specifications on file.

SEATTLE, WASH.—Board of Public Works is advertising for a considerable number of miscellaneous supplies for the Lake Union Steam Power Plant.

SEATTLE, WASH.—Gray & Barash, electrical engineers and contractors have permits to erect a $4000 warehouse; $15,000 machine shop and $1000 office building at 63 Horton street.

SKYKOMISH, WASH.—Bonds of $7000 for the construction of a municipal lighting plant carried and bids for the issue will be opened early in October.

BAKER CITY, ORE.—D. C. Eccles and associates are preparing to erect an electric transmission line from the terminus of the Eastern Oregon Light & Power Company's line to the Bi-Metalic mine near here.

CORNUCOPIA, ORE.—A 66,000-volt line is to be built from Robinette to Halfway, a distance of 12 miles, for the purpose of delivering a minimum of 200-horsepower electrical energy to the Cornucopia Mines Company here. A substation will also be erected in Halfway and a distribution system is to be constructed so that this community may have service for lighting, power and general domestic purposes. The estimated cost of constructing lines and substation is $30,000.

MAPLETON, ORE.—North Star Power Company has bought the electric lighting business of R. H. Clow.

CHICO, CAL.—Board of City Trustees has advertised for bids to furnish the city with intersection lights for the residential section and power for the electrolier system.

FRESNO, CAL.—The work of overhauling electric fire-alarm system under the recent appropriation of $2000 was begun with the arrival of a carload of 50 telegraph poles.

GARDEN GROVE, CAL.—An election will be held October 11 to act on the formation of the Garden Grove Lighting District in Orange county.

LOS ANGELES, CAL.—Council has adopted ordinance creating the Culver City Lighting System.

LOS ANGELES, CAL.—F. C. Riley and G. W. Gilbreth, of Los Angeles, have asked permit to use 20 second feet of San Gabriel River, 15 second feet of Iron Fork and 15 second feet of Fish Creek for hydroelectric power purposes. Plans provide for a tunnel and a six-mile pipe line and equipment for generating 8000 kilowatts. Cost is estimated at $500,000.

LOS ANGELES, CAL.—United Light & Power Company will start work in 30 days on a dam at the mouth of Prairie Fork, in upper San Gabriel Canyon, and on the building of two power plants. The dam will be of concrete of the Eastwood type and 200 feet high, 500 feet at the top and 100 feet at the bottom. The first power plant will have a power drop of 1248 feet and will develop 8000 horsepower. A power sluice will lead from the first plant to the second powerhouse, a distance of six miles. This will have a drop of 1818 feet and will develop 14,000 horsepower. By the construction of 7.7 miles of transmission line it will be possible to connect with any important electric company of southern California. The cost of the project is figured at $2,000,000. G. O. Newman is chief engineer.

MOJAVE, CAL.—An election has been called for vote on the formation of the Mojave Lighting District.

NAPA, Cal.—Earl Wilson has been awarded contract to supply the city with 358-candlepower lights.

OROVILLE, CAL.—Richard M. Dale, of San Francisco, has applied for permit to use 750 cubic feet per second of Middle Fork of Feather River for hydroelectric power to be used for manufacturing purposes. He proposes to build a 60-foot concrete dam and utilize 50 feet head and will generate 4260 horsepower. Cost is estimated at $300,000.

OROVILLE, CAL.—J. Sank, of Oroville, has applied for permit to use 28 cubic feet per second from French Creek for hydroelectric generating power for mining and manufacture. His plans are to construct a timber crib dam and build

ELECTRIC SUPPLY COMPANY
MEMPHIS, TENN.
W. R. HERSTEIN, Secretary-Treasurer
REPRESENTING:
GENERAL ELECTRIC CO., PHILLIPS WIRE CO., HOTPOINT ELECTRIC HEATING CO., NATIONAL CARBON CO.,
And Other Leading Manufacturers—
ELECTRICAL JOBBERS EXCLUSIVELY
NO RETAILING :: :: NO CONTRACTING

a flume and pipe line two and one-half miles long and will utilize a fall of 800 feet and develop 2545 horsepower. Cost is estimated at $136,000.

QUINCY, CAL.—Great Western Power Company will build an electric transmission line from Veramont station, near Taylorsville, to the Genesee and Walker mines, a distance of 16 miles.

SAN FRANCISCO, CAL.—Asher Electric Company has received contract to install electrical equipment, consisting of telephone poles and transmission lines, at Angel Island.

SAN FRANCISCO, CAL.—Great Western Electro-Chemical Company will hold a meeting November 28 to act on question of increasing its capital from $2,500,000 to $5,000,000.

SAN FRANCISCO, CAL.—E. E. Lindsey, of San Francisco, has applied for permit to use 30 cubic feet per second of Bucks Creek in Plumas County for a hydroelectric plant, which is to supply power for electrochemical manufacturing. He proposes building a timber crib, rock filled dam, 20 feet high and constructing a flume and pipe line three-fourths mile long. He will utilize a fall of 1400 feet and develop 4470 horsepower. Cost is estimated at $194,000.

SAN FRANCISCO, CAL.—Frank Pellissier and E. S. Moore have applied for authority to build and operate a telephone line along the Inyo County Road from Bishop to the Inyo-Mono County line, opposite the town of Laws, to connect with Bishop and the Interstate Telegraph Company's system and to be a continuation of the line now being constructed by the applicants in Mono county.

SAN FRANCISCO, CAL.—Sierra & San Francisco Power Company has filed a supplemental application for authority to pay $450,000 for the La Grange Division of the Yosemite Power Company, out of the proceeds of the sale of $1,000,000 first mortgage bonds.

SAN FRANCISCO, CAL. — Western States Gas & Electric Company has arranged with the Northern California Power Company to secure 1000 kilowatts of hydroelectric energy to be delivered to the Eureka division of the former company, which is thus enabled to shut down one of its steam generating plants.

SAN MATEO, CAL.—City trustees are having plans drawn for extensions to the street lighting system on Main street and on Broadway.

TAHOE CITY, CAL.—Lora J. Moore, of Tahoe City, has plans for developing hydroelectric power on Slim Jim Creek in Placer County and will build a rubble dam and lay a pipe line 5800 feet long. He will utilize 309 feet fall and develop 171½ horsepower. Cost estimated at $10,000.

WATTS, CAL.—City Board of Trustees has ordered the installation of ornamental electric lights on portions of Christian, Diller and Lillian streets.

INCORPORATIONS

REFORM, ALA.—Reform Ice & Light Company. Capital $3000. A. J. Straub Jr., and Earl Beatty.

SAN FRANCISCO, CAL. — Northern Electric Railway Company. Capital, $10,000. Directors: G. B. Davis, E. Coe and W. J. Hayes.

DOVER, DEL.—Eastern Dakota Electric Company. Capital, $600,000. To operate power plants to generate electricity. Incorporators: F. A. Armstrong, C. L. Rimlinger, Wilmington, and C. M. Egner, Elkton, Md.

JACKSONVILLE, FLA.—Jacksonville, Tampa & Miami Railway. Capital, $10,000,000. The plans are to build an electric railway between Jacksonville and Tampa and other points, distance of 500 miles. True Davis is president.

PEORIA, ILL.—Power Transmitting Company. Capital, $200,000. Incorporators: Emil Kramer and Henry H. White.

ELKHART, IND.—Standard Ignition Company has incorporated with a capital of $200,000 to manufacture magnetos, parts and electrical devices. Directors: Andres H. Beardsley, Martin E. Crow, William H. Foster, John F. O. Stratton and Edward B. Zigler.

GARY, IND.—Gary Electric Company. Capital, $5000. The company will buy and sell electrical fixtures. Directors: Lloyd B. Snowden, Vaughn O. Snowden and David L. Snowden.

GARY, IND.—Gary Street Railway Company. Capital, $10,000. Incorporators: Thomas W. King, B. B. Clark, M. Arnold, M. H. Shiel and M. Riley.

BEE SPRINGS, KY.—Lashley Telephone Company has been incorporated by Charles Lashley, P. V. Lashley and Porter Lashley.

WEST LIBERTY, KY.—War Creek Telephone Company. Capital, $500. Incorporators: A. J. Howertn, L. T. Roman, T. H. Easterling and Thomas Adams.

OMAHA, NEB.—Union Power & Light Company. Capital, $2,000,000. Incorporators: Walter B. Roberts, Willis Todd, F. H. Davis, C. T. Kountze and T. L. Davis.

CAMDEN, N. J.—McLoughlin Manufacturing Company. Capital, $50,000. To engage as electrical engineers and manufacture electrical goods, etc. Incorporators: James Scott, William J. Strandwitz, William J. McLoughlin, and Lee E. Griscom.

BUFFALO, N. Y.—Electric City Contracting Company. Capital, $10,000. Electrical contractors. Incorporators: Paul Sheehan, Daniel W. Peck and Jacob Sicherman, Buffalo.

GROTON, N. Y.—Groton Electric Power Corporation. Captial, $20,000. To operate a generating plant and distributing system for local service. Incorporators: O. E. Wasser, J. B. Carey and I. J. Magee, 622 West One Hundred and Thirteenth street, New York City.

NEW YORK, N. Y.—Improved Sign Company. Capital, $100,000. To manufacture electric signs. Incorporators: H. S. Williams, F. M. Whittemore and B. Riesner, 550 West One Hundred and Forty-fourth street, New York.

CLEVELAND, O.—C. & C. Electric Construction & Sales Company. Capital, $10,000. Incorporators: F. L. Stevens, F. M. Corny, Raymond I. Blakeslee, Clayton H. Warner and Calvin J. Hinds.

CLEVELAND, O.—Keller Switchboard Manufacturing Company. Capital, $15,000. Incorporators: Claude A. Keller, Stanley Setny, O. D. Eshelman, Warren W. Richmond and Louis Barnes.

TULSA, OKLA.—Fortier Electric Manufacturing Company. Capital, $30,000. To manufacture electric fixtures of various kinds. Incorporators: U. D. Fortier, George M. Schiek, and M. P. Latimer, Tulsa.

FLAT CREEK, TENN.—Flat Creek Mutual Telephone Company. Capital, $7000. Incorporators: J. C. Tune, J. J. Hix, R. S. Hudson, J. P. Cromier, J. M. Gammil and B. D. Kingree.

DALLAS, TEX.—Dallas Power & Light Company. Capital, $150,000. The principal stockholder is Harry M. Durning, of New York, and other incorporators are: C. E. Calder, J. F. Strickland and W. D. Head.

DALLAS, TEX.—Dallas Railway Company. Capital, $100,000. Inco porators: James C. Duke, Herbert M. Hughes and Charles W. Hobson.

STUART, VA.—Stuart Telephone Company. Capital, $5000. To operate a local telephone system. Incorporators: H. L. Hooker, H. O. Blackard and Robert N. Clark.

SEYMOUR, WIS.—Seymour-Shiocton Telephone Company. Capital, $100,000. Incorporators: William Walton, Henry W. Kimberly and C. J. Jackson.

PROPOSALS

ELECTRICAL SUPPLIES.—Bureau of Supplies and Accounts, Navy Department, Washington, D. C., has asked for bids for the following supplies under schedules given herewith. 13,500 feet leaded and armored interior communication cable, delivery at Puget Sound, Wash., schedule 1503; 4000 feet armored interior communication cable, 9000 feet single covered bell cord and 20,000 feet copper conducting cord, delivery at Brooklyn, N. Y., schedule 1505; 150,000 feet major caliber ignition fuses, delivery f. o. b. works, schedule 1506; one circulating salt water, direct-connected centrifugal pump, delivery at Brooklyn, N. Y., schedule 1502; one fire and flushing centrifugal pump, with electric motor, delivery Mare Island, Cal., schedule 1501; 75,000 feet aerial silicon bronze wire, delivery at Brooklyn, N. Y. schedule 1505; 200,000 feet plain bell wire, delivery at Puget Sound, Wash., schedule 1503; 150,000 feet lead-covered, rubber-insulated wire, delivery at Brooklyn, N. Y., schedule 1504; 36,000 feet single conductor, lighting and power wire, delivery at Puget Sound, Wash., schedule 1503; 77,000 feet single conductor, rubber-covered stranded wire and 125,000 feet twisted telephone wire, delivery at Brooklyn, N. Y., schedule 1504.

ELECTRICAL SUPPLIES.—Proposals for boiler, tubes, steel cable, nails, bronze, sheet copper, sheet brass, copper tubing, brass tubing, electric cable and wire, Monel metal, solder, sheet zinc, steam capstan windlass, steering engine, steering stand, gypsy, switchboard, transformers, electric attachments and fixtures, anvils, vises, jacks, pliers, punches, wrenches will be received at the office of the General Purchasing Officer of the Panama Canal, Washington, D. C., until 10:30 a. m., Oct. 11. Plans and information relating to this circular (No. 1170) may be obtained from this office or offices of the Assistant Purchasing Agent, 24 State Street, New York City; also from Benedict Crowell, Major E. O. R. C., U. S. Army General Purchasing Officer.

Electrical Patents Issued September 25, 1917

Prepared by Thomas Howe, Patent Attorney, 2 Rector Street, New York, N. Y.

1,240,806. Method of Building Communications for Amateurs. V. G. Apple, Dayton, Ohio. Manner of forming segments with connected terminals.

1,240,811. Signaling System. C. E. Beach, Binghamton, N. Y., assignor to Gamewell Fire Alarm Telegraph Co. Combined telephone and telegraph system.

1,240,814. Trolley. J. A. Booth, Springfield, Ill. Guard structure.

1,240,844. Insulator. F. S. Gregur, West Brownsville, Pa. Specially clamped two, part structure.

1,240,856. Galvanic Battery. H. H. Meno, assignor to Edison Storage Battery Co., West Orange, N. Y. Relates to special venting means for container.

1,240,877. Controlling Mechanism for Electric Motors. C. Redfield, Ogden, Utah. Compensator control for alternating machines.

1,240,885 and 1,240,886. Galvanic Battery. R. Schuster, assignor to Schuster-Patent-Gesellschaft, Berlin, Germany. Has special provision for disposing of products of decomposition given off by the cathode.

1,240,896. Safety Device for Electrical Circuits. M. H. Spielman, New York, N. Y. Incandescent lamp circuit is controlled by cord reel.

1,240,897 and 1,240,898. Electric-Railway System. K. E. Stuart, Phila., Pa. Block systems wherein vehicle propelling motors are controlled through track conductors and including means whereby a vehicle converts a motor on an adjacent car into a braking generator.

1,240,900 and 1,240,901. Electric Welding-Tool. W. E. Symons, New York, N. Y. Electrode holders for arc welding.

1,240,907. Electric Wiring System. F. A. Watkins, Chicago, Ill. For supporting and supplying current to a number of electric lamps.

1,240,930. Electric Regulator. C. A. Boddie, assignor to Westinghouse Elec-

tric & Mfg. Co. **Vibratory contact field regulator.**

1,240,958. **Condenser.** H. P. Donle, assignor to Conn. Telephone & Electric Co., Meriden, Conn. A structure of adjustable device.

1,240,965. **Plug Contact-Maker.** H. Gallet, assignor to Etablissements De Dion, Boston, Societe Anonyme, Puteaux, France. Structural details.

1,240,973. **Starting Internal Combustion Engines.** O. Heins & C. M. Wild, assignors to Bosch Magneto Co., New York, N. Y. Gearing arrangements.

1,240,974. **Telephone Wall Set.** W. W. Henry, assignor to Couch Co., Inc., Atlantic, Mass. Details of construction.

1,240,975. **Commutator.** W. T. Hensley, assignor to Bound Brook Engine & Mfg. Co., Boundbrook, N. J. Manner of clamping and insulating segment.

1,241,030. **Swivel Electric Connection.** W. Schade, St. Louis, Mo. Comprises two mating half portions arranged end to end in axial alinement.

1,241,055. **Electric Automobile-Clock.** W. H. Thompson, assignor to Thompson Electric Clock Co., Memphis, Tenn. Details of electromagnetically operated mechanism.

1,241,062 and 1,241,063. **Electric Signaling System.** S. M. Ward, Jr., assignor to J. T. Clarke, New York, N. Y. Railway block systems.

1,241,071. **Portable Electric Light.** W. H. Zachmann, assignor to National Carbon Co., Long Island City, N. Y. Flashlight having its casing made of longitudinally separated parts hinged at the end opposite the lamp.

1,241,074. **Non-Glare Headlight Deflector.** A. Bailey, Jr., Milwaukee, Wis. Structural details.

1,241,077. **Portable Electric Light.** W. Bauer, assignor to National Carbon Co., New York, N. Y. Flash light structure.

1,241,098. **Show-Case Light.** J. F. Doyle, Jr., Garden City, and M. D. Avillar, New York, N. Y. Is mounted in a tube through which air is circulated.

1,241,106. **Electric-Sign Receptacle.** R. M. Frydrychowicz, Stevens Point, Wis. Structural details.

1,241,115. **Starting Internal-Combustion Engines.** O. Heins & C. M. Wild, assignors to Bosch Magneto Co., New York, N. Y. Motor arrangement for initiating starting with a certain speed characteristic and weakening the field to change the speed characteristics when the engine reaches critical speed.

1,241,134. **Driving Mechanism for Magnetos.** A. Maire, assignor to Societe Lorraine Des Anciens Establissements De Dietrich & Cie., De Luneville, Paris, France. Gearing and mounting arrangements.

1,241,139. **Electromagnetic Device.** W. C. Neahr, assignor to Protective Signal Mfg. Co., Denver, Colo. Electromagnet structure for use with alternating current.

1,241,151. **Electric Indicator.** H. H. Riggs, Kharput, Turkey. Comprises a series of electromagnets adapted to rotate a magnetic needle.

1,241,157. **Electric Switch.** A. Simon, assignor to Cutler-Hammer Mfg. Co., Milwaukee, Wis. Electromagnetically operated switch for polyphase alternating currents.

1,241,158. **Connector for Electric Wires.** A. B. Simpson, Jersey City, N. J. Structure for connecting conductor ends formed of a strip of pliable metal.

1,241,172. **Electric-Lamp Guard.** C. Vondrashek, La Crosse, Wis. Structure of device comprising a wire mesh basket.

1,241,180. **Controller for Electric Motors.** G. H. Whittingham, assignor to Monitor Controller Co., Baltimore, Md. Electromagnetically and manually controlled resistance starter.

1,241,191. **Automatic Control for Valves.** J. Bruckner & F. Hamberger, Brooklyn, N. Y. Valve is electromagnetically operated and thermostatically controlled.

1,241,197. **Method and Apparatus for Determining Subterraneous Conductors.** H. R. Conklin, Joplin, Mo. Presence of the conductor is made evident by its effect on an oscillating magnetic field.

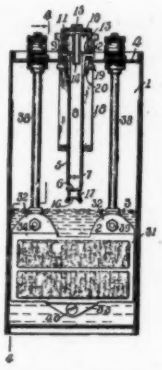
1,241,208. **Hot-Water Heating System.** A. M. Gow, assignor one-half to S. H. Hill, Duluth, Minn. Radiator valve is automatically controlled electromagnetically.

1,241,213. **Projectile-Fuse Testing Apparatus.** C. L. Heisler, Schenectady, N. Y. A recording chronometer is electrically connected with and controlled by the fuse timing powder train testing apparatus.

1,241,226. **Dry-Cell Tamping Apparatus.** H. T. Lang, Fremont, Ohio, assignor to National Carbon Co., Inc. Structure of machine.

1,241,234. **Electric Bath-Cabinet.** H. C. Marrinan, St. Paul, Minn. Combined bath and heating cabinet wherein the control of the electric heaters and shower bath are inter-related.

1,241,244. **Electrically-Heated Water Containing Radiator.** O. A. Palmer, assignor one-half to P. W. Tibbits, Wayzata, Minn. For heating apartments.



No. 1,240,856—Galvanic Battery.

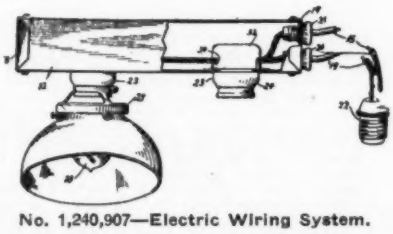
1,241,245. **Motor-Fan.** L. J. Parker, assignor to Hunter Fan & Motor Co., Fulton, N. Y. Ceiling type.

1,241,249. **Machine for Making Distance Record Devices for Metal Working Machines.** T. P. Payne, assignor to Steel Utilities, Inc., Newark, N. J. Key-board control electric circuits for controlling punches of machine for making distance record sheets for shape punching machines.

1,241,259. **Machine for Operating on Structural Beams.** E. V. Wurts, assignor to Steel Utilities, Inc. Electrically controlled.

1,241,260. **Machine for Punching and Cutting Angle-Plates.** E. V. Wurts, & L. A. Hawthorne, assignor to Steel Utilities, Inc. Electromagnetically controlled.

1,241,266. **Metal Working Machine.** E. V. Wurts, Pittsburgh, Pa., assignor to Steel Utilities, Inc. Electrically controlled machine for punching structural shapes at pre-determined points.



No. 1,240,907—Electric Wiring System.

1,241,267. **Metal Punching Machine.** L. A. Hawthorne, Newark, N. J., assignor to Steel Utilities, Inc. Shapes operated upon are electromagnetically held in position.

1,241,268. **Machine for Making Distance Record Devices for Metal-Working Machines.** T. P. Payne, assignor to Steel Utilities, Inc. Is electrically controlled by key-board.

1,241,270. **Projector Arc-Lamp.** B. Perris, assignor to National Carbon Co., Cleveland, Ohio. Has special structure of negative electrode.

1,241,273. **Rotatable Contact-Breaker for Magnetos and Other Purposes.** E. J. Pilblad, assignor to Imperial Typewriter Co., Ltd., Leicester, England. Structural details.

1,241,275. **Electrical Measuring Instrument.** W. E. Porter & A. L. R. Ellis, assignors to General Electric Co. Special arrangement of permanent and electro magnets acting on a movable armature, together with a damper, for indicating instruments.

1,241,284. **Means for Automatically Regulating Automobile-Headlights.** L. T. Rhoades, assignor to New York Coil Co., Inc., New York, N. Y. Lamps supplied by engine driven generator are controlled by draft produced by engine.

1,241,289. **Electrically-Operated Apparatus for Ice-Rinks.** D. H. Scott, Cleveland, Ohio. Manner of forming electrical connections with a vehicle operating upon the floor of a rink.

1,241,310. **Electric Lighting and Heating of Railway and Other Vehicles.** C. H. Vidal, London, England. Axle driven system.

1,241,317. **Synchronous Dynamo-Electric Machine.** F. P. Whitaker, assignor to General Electric Co. Structure and arrangement of starting motor for synchronous machine.

1,241,339. **Combined Spark-Plug and Spark-Gap.** W. C. Brunke, assignor to Efficiency Motor-Device Corp., Omaha, Nebr. Structural details.

1,241,351. **Electric Furnace.** J. L. Dixon, Sheffield, England. For operation by three-phase current.

1,241,358. **Automatic Electric Safety-Gate.** R. Eades, assignor one-fourth to J. S. Hays, Winchester, Ky., and one-fourth to F. H. McClung, Ashland, Ky., and H. H. Moore, Winchester, Ky. For railroad crossings.

REISSUES.

14,367. **Indicating-Signal for Vehicles.** W. P. Hammond, Passaic, N. J. Direction indicator.

Patents Expired.

The following United States electrical patents expired on October 2, 1917:

658,792. Circuit-making and Breaking Device. F. M. Lincoln, Niagara Falls, N. Y.

658,808. Motor Wheel for Automobiles. H. Simmons, Wellston, O.

658,814. Means for Delicately Suspending Moving Parts. W. Stanley and H. M. Smith, Great Barrington, Mass.

658,835. Method of Producing Phase Displacement. W. Stanley, Great Barrington, Mass.

658,860. Cover for Battery Jars. P. P. Nungesser, Cleveland, O.

658,862. Telegraphone. E. C. Paramore, Philadelphia, Pa.

658,865. Secondary Battery. H. C. Porter, Chicago, Ill.

658,891. Electrode and Electrode Connection. H. Carmichael, Malden, Mass.

658,892. Canal-boat Propulsion. J. B. Entz, Philadelphia, Pa.

658,900. Battery Fluid. G. Romanelli, New York, N. Y.

658,905. Electric-current Regulator. D. Watkins, Davenport, Iowa.

658,924. Electrical Fitting. W. T. Fringle, Lansdowne, Pa.

658,925. Electric Switch. N. D. Rand, Watertown, Mass.

658,929. Electrical Semaphore System. J. Shoecraft, Topeka, and C. C. Gardiner, Bradford, Kans.

658,997. Electrical Propelling Apparatus. D. Perret, Neufchatel, Switzerland.

659,012. Automobils. O. V. Bachelle, Chicago, Ill.

659,080. Supporting Frame for Motors of Electric Carriages. C. A. Lindstrom, Chicago, Ill.

659,096. Combined Relay and Repeater for Telephone Lines. E. C. Paramore, Philadelphia, Pa.

659,121. Appliance for Automobiles. E. W. Ayres, Washington, D. C.

659,134. Self-closing Valve for Steam Pipes. F. W. Churchouse, Tacoma, and H. O. Benedict, Seattle, Wash.

659,142. Crossing for Suspended Electric Conductors. J. Floyd, Washington, D. C.

659,169. Mechanism for Supplying Electric Power to Railway Cars. G. F. Gale, Boston, Mass.

659,178. Electric-railway System. E. C. Morgan, Chicago, Ill.

659,179. Combined Third and Traction Rail for Electric Railways. E. C. Morgan, Chicago, Ill.

Reissue 11,859. Electric Railway. J. B. Entz, Philadelphia, Pa.

Financial News and Comment

Commonwealth Light & Power Company has sold to New York bankers a new issue of $800,000 two-year 6 per cent secured gold notes. They are being offered at 98⅛ and interest, yielding 7 per cent. The notes are dated Sept. 1, 1917, and are callable on or before Sept. 1, 1918, all or part, upon four weeks' notice, at 101 and interest, thereafter until maturity at 100½ and interest.

Union Power & Light Company has sold to Omaha bankers $500,000 7 per cent participating cumulative preferred (a. and d.) stock. The company agrees to redeem $25,000 of the preferred stock on Jan. 1, annually at $100 for the years 1921-1935, and at $102 for the years 1936-1940. The company owns and operates, without competition, service stations and transmission lines furnishing power to a group of towns in Nebraska, Iowa and South Dakota.

Western Maine Power Company has sold to Portland bankers $108,000 of an authorized issue of $450,000 first lien 5 per cent secured gold notes, dated Dec. 1, 1916, due Dec. 1, 1919. They are being offered at 97¼ and interest, yielding 6½ per cent. The notes are callable at 101 and interest on any interest date.

Western Electric Company sales for the first eight months of the year were approximately $100,000,000, the gain being pretty evenly distributed among different classes of customers and between its own manufactures and other merchandise.

Gross sales for the first eight months totaling $100,000,000 are at an annual rate of $133,000,000, which compares with just under $107,000,000 during the 12 months to Dec. 31, 1916. It is a record of business which the company has never before attained.

Incidentally it becomes apparent that a company producing apparatus for telephone use and allied electrical services at the rate of $133,000,000 per annum is working to the limit of its ability to meet the telephone needs of the country. Of course, the Bell system is patriotically giving the government's pressing needs first consideration. But it is very far from relaxing any of its earnest efforts to see that the public is fully served.

Reports of Earnings.

COMMONWEALTH POWER, RAILWAY & LIGHT CO.

	1917.	1916.
August gross	$1,585,919	$1,358,867
Net	656,981	667,860
Surplus after charges	125,407	174,133
Balance after pfd. div.	35,612	86,783
Eight months' gross	12,445,546	10,820,081
Net	5,584,398	5,585,870
Surplus after charges	1,383,794	1,641,543
Balance after pfd. div.	665,844	976,392
Twelve months' gross	18,582,072	16,152,529
Net after tax	8,586,514	8,426,386
Surplus after charges	2,393,994	2,596,224
Balance after pfd. div.	1,322,024	1,611,074

UNITED RAILWAYS, SAN FRANCISCO.

United Railroads of San Francisco, a subsidiary of the California Railway & Power Company, reports as follows for the fiscal year ended June 30, 1917:

	1917.	1916.
Gross earnings	$7,458,142	$7,751,743
Net earnings	2,205,940	2,337,709
Other income	163,121	178,525
Total income	2,369,061	2,576,234
Interest, etc.	2,105,582	2,047,738
Net income	263,479	468,496

UNION ELECTRIC LIGHT & POWER.

Income account of the Union Electric Light & Power Company for twelve months ended June 30, 1917, as filed with the New York Stock Exchange, is as follows:

Operating revenues	$5,664,662
Operating expenses, depreciation and taxes	4,187,635
	$1,477,027
Non-operating revenues	126,412
Gross income	$1,603,439
Interest charges	1,032,516
Net income	$ 570,923

NEW YORK RAILWAYS COMPANY.

The New York Railways Company reports for the year ended June 30 last:

	1917.	1916.
Gross. oper. rev.	$11,494,109	$13,714,531
Net oper. rev.	3,625,299	5,340,452
Oper. income	2,593,287	4,302,330
Gross income	3,242,887	4,870,199

UNITED LIGHT & RAILWAYS CO.

United Light & Railways Company report for twelve months ended Aug. 31:

		Increase.
Subsidiary companies	$1,271,806	$12,204
Div. int. rec. on invest.	553,494	98,603
Miscellaneous earnings.	191,544	55,602
Total gross earnings	2,016,845	166,410
Less expense	164,112	23,210
Int. on bonds, notes	655,942	95,952
Bond disc. amortized	.....	*5,015
Pro rata dividends on first preferred stock	602,723	10,207
Net earnings	1,196,790	52,262
Surplus earnings	594,067	42,055

*Decrease.

Subsidiary companies:		
Gross earnings of subsidiary companies	$7,241,842	$505,654
Oper. exp., etc., subsid. cos. includes maint. and fed. inc. tax	4,503,162	443,803
Net earnings	2,738,679	61,850
Interest, etc.	1,450,310	51,192
Net profit	1,288,368	10,657

Copper Situation.

The Government's action in fixing the price of copper at 23.5 cents seems not to have cleared the atmosphere in the copper trade. Those who would buy copper for the domestic industries at that figure find no offers for delivery prior to January 1, as producers have their output under contract for the period covered by the official price arrangement; and the Government's four-months decree places no restrictions on producers who may choose to ask 26 cents for delivery after the expiration of that period, as some are reported to have done. It seems apparent that no sales are being made at 23.5 cents to consumers other than the Government. The interpretation is that this price is not binding in the case of contracts made for delivery after the expiration of price period named; and as producers in many cases claim to have no stock for delivery during the remainder of the year, the effectiveness of the Government price is nullified so far as domestic consumers are concerned.

Producers are many of them carrying out contracts for October, November and December delivery at 25 to 30 cents, and it is not likely these will be interfered with. If the dealer buys copper at 23.5 cents and is compelled to sell at the same price he will manifestly not handle much copper. The average consumer cannot expect to be supplied with stock by the producers direct, hence, the elimination of the dealer is neither practicable nor likely. Then, there is some confusion as to the price of lake and casting copper, because in the price-fixing it seems only electrolytic was specified. The purpose of this comment is to show some of the confusing problems which have presented themselves.

Advices are that the Government is developing plans to make arrangements more workable, and in this connection a pool of the copper output of the country is proposed.

The costs of producing copper, which are assumed to form the basis for stabilizing prices, present a wide range of figures.

WEEKLY COMPARISONS OF CLOSING-BID PRICES OF SECURITIES OF LEADING ELECTRICAL COMPANIES.

Quotations furnished by F. M. Zeller & Co., Rookery Bldg., Chicago.

	Div. rate. Per cent.	Bid Sept. 25.	Bid Oct. 2.
Public Utilities—			
Adirondack Electric Power of Glens Falls, common	..	16	13
Adirondack Electric Power of Glens Falls, preferred	6	68	62
American Gas & Electric of New York, common	10+extra	111	103
American Gas & Electric of New York, preferred	6	45	45
American Light & Traction of New York, common	..	260	264
American Light & Traction of New York, preferred	6	103	103
American Power & Light of New York, common	4	60	60
American Power & Light of New York, preferred	6	82	82
American Public Utilities of Grand Rapids, common	..	28	28
American Public Utilities of Grand Rapids, preferred	6	62	61
American Telephone & Telegraph of New York	..	118⅜	115⅝
American Water Works & Elec. of New York, common	..	5½	5
American Water Works & Elec. of New York, particip	7	12	13
American Water Works & Elec. of New York, first preferred	..	65	62
Appalachian Power of Bluefield, common	..	2½	3
Appalachian Power of Bluefield, preferred	7	24	25
Cities Service of New York, common	+extra	234	227
Cities Service of New York, preferred	6	81½	81⅛
Commonwealth Edison of Chicago	8	117	118
Comm. Power, Railway & Light of Jackson, common	4	45	43
Comm. Power, Railway & Light of Jackson, preferred	6	74	74
Federal Light & Traction of New York, common	..	10	10
Federal Light & Traction of New York, preferred	..	4½	45
Illinois Northern Utilities of Dixon	6	77	77
Middle West Utilities of Chicago, common	2+2 extra	39	39
Middle West Utilities of Chicago, preferred	6	67	67
Northern States Power of Chicago, common	ex div. 7	77½	74
Northern States Power of Chicago, preferred	ex div. 7	95	93
Pacific Gas & Electric of San Francisco, common	5	46¾	41
Pacific Gas & Electric of San Francisco, preferred	6	85	83
Public Service of Northern Illinois, Chicago, common	7	86½	87
Public Service of Northern Illinois, Chicago, preferred	8	94	94
Republic Railway & Light of Youngstown, common	4	30	29
Republic Railway & Light of Youngstown, preferred	6	64	64
Standard Gas & Electric of Chicago, common	..	7½	7
Standard Gas & Electric of Chicago, preferred	6	31½	30
Tennessee Railway, Light & Power of Chattanooga, common	..	4	4
Tennessee Railway, Light & Power of Chattanooga, preferred	6	26	22
United Light & Railways of Grand Rapids, common	4	35½	37
United Light & Railways of Grand Rapids, preferred	6	67	67
Western Power of San Francisco, common	..	10	11⅜
Western Power of San Francisco, preferred	6	50	50
Western Union Telegraph of New York	extra	88⅝	88
Industrials—			
Electric Storage of Philadelphia, common	4	56½	56
General Electric of Schenectady	8	145⅝	140½
National Carbon of Cleveland, common	8	*72	75
National Carbon of Cleveland, preferred	..	130⅜	*130⅜
Westinghouse Electric & Mfg. of Pittsburgh, common	5+extra	47	46
Westinghouse Electric & Mfg. of Pittsburgh, preferred	7	63	63

*Last sale.